List of Boundary-value Problem (P3C) s for 3D Cartesian Domains, for which the Green’s Functions for Poisson’s Equation have been derived

Green’s functions to these Problems can be found in the book:
Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C) 1. Space \((-\infty \leq x_1, x_2, x_3 \leq \infty)\)
This Section formulates a boundary-value Problem (P3C) on constructing Green’s function, \(G\) of Poisson equation for the space, final Answer to it provided.

\[
\begin{align*}
\nabla^2 G(x_1, \xi_1; x_2, \xi_2) &= -\delta(x - \xi), \\
\nabla^2 U(x_1, x_2) &= -f(x_1, x_2),
\end{align*}
\]

in the inner points of the space. At infinity the functions \(G\) and \(U\) must vanish.

Problem (P3C).1 To construct the Green’s function \(G(x, \xi)\) for Poisson’s equation \(\nabla^2 G(x, \xi) = -\delta(x - \xi)\) for the space \((-\infty \leq x_1, x_2, x_3 \leq \infty)\).

The Answer to Problem (P3C).1 for space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C)2. Half-space \((0 \leq x_1 \leq \infty, -\infty \leq x_2, x_3 \leq \infty)\)
This section formulates two boundary-value Problem (P3C) s on constructing Green’s functions, \(G^{(j)}\), \((j = 1 - 2)\), of Poisson’s equation for the half-space
**Figure 2**: Half-space with boundary plane $\Gamma_{10}$.

**(P3C) 2.1. Boundary-value Problems**

Let us consider the following boundary value Problem (P3C) s which consist from the Poisson equation

$$\nabla^2 U(x_1, x_2) = -f(x_1, x_2)$$

in the inner points of the half-space. At infinity the functions $U$ must vanish.

On the boundaries, one of the following two functions are given:

$$\partial U(0, y_2, y_3)/\partial n_1 = g_1(0, y_2, y_3) \quad \text{or} \quad U(0, y_2, y_3) = s_1(0, y_2, y_3)$$

$$\nabla^2 G(x_1, \xi_1; x_2, \xi_2) = -\delta(x - \xi)$$

and the boundary conditions defined below for each Problem (P3C).

**Problems (P3C) 2.1- (P3C)2.2**

To construct the Green’s functions for Poisson’s equation $\nabla^2 G(x, \xi) = -\delta(x - \xi)$ for the half-space $(0 \leq x_1 \leq \infty, -\infty \leq x_3 \leq \infty)$ under the following boundary conditions:

The solutions of the 16 Problem (P3C) s and their related Green’s functions $G^{(j)}$, $(j = 1-16)$ for Poisson’s equation $\nabla^2 G(x, \xi) = -\delta(x - \xi)$ for the rectangular $(0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2)$ are given below for the suitable boundary conditions defined in the boxes:

**Problem (P3C) 2.1**

$$G^{(1)} = 0; \quad x_1 = 0, -\infty \leq x_2, x_3 \leq \infty; \quad U(0, y_2, y_3) = S(0, y_2, y_3)$$

The Answer to Problem (P3C) 2.1 for half-space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 2.2**

$$\partial G^{(2)}/\partial x_1 = 0; \quad x_1 = 0, -\infty \leq x_2, x_3 \leq \infty, \partial U/\partial n_1 = g(0, y_2, y_3)$$
Problem (P3C) 2.2 for half-space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C)3. Quarter-space \(0 \leq x_1, x_2 \leq \infty, -\infty \leq x_3 \leq \infty\)

This Section formulates four boundary-value Problem (P3C) s on constructing Green’s functions, \(G^{(j)}, (j = 1-4)\), of Poisson’s equation for the quarter-space

\[\nabla^2 G(x_1, \xi_1, x_2, \xi_2) = -\delta(x - \xi)\]
\[\nabla^2 U(x_1, x_2) = -f(x_1, x_2)\]

in the inner points of the half-space. At infinity the functions \(G\) and \(U\) must vanish.

To construct the Green’s functions \(G^{(j)}, (j = 1-4)\) for Poisson’s equation \(\nabla^2 G(x, \xi) = -\delta(x - \xi)\) for the quarter-space \((0 \leq x_1, x_2 \leq \infty, -\infty \leq x_3 \leq \infty)\) under the following homogeneous boundary conditions:

Problem (P3C) 3.1

\[
\begin{align*}
G^{(l)} &= 0; x_1 = 0, 0 \leq x_2 \leq \infty, -\infty \leq x_3 \leq \infty; \quad U(0, y_2, y_3) = s_1(0, y_2, y_3); \\
G^{(l)} &= 0; x_2 = 0, 0 \leq x_1 \leq \infty, -\infty \leq x_3 \leq \infty; \quad U(y_1, 0, y_3) = s_2(y_1, 0, y_3).
\end{align*}
\]

The Answer to Problem (P3C) 3.1 for quarter-space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 3.2

\[
\frac{\partial G^{(2)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq \infty, -\infty \leq x_3 \leq \infty; \partial U(0, y_2, y_3) = g_1(0, y_2, y_3); \\
\frac{\partial G^{(2)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, -\infty \leq x_3 \leq \infty; \partial U(y_1, 0, y_3) = g_2(y_1, 0, y_3)
\]

The Answer to Problem (P3C) 3.2 for quarter-space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 3.3

\[
\frac{\partial G^{(3)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq \infty, -\infty \leq x_3 \leq \infty; \partial U(0, y_2, y_3) = g_1(0, y_2, y_3); \\
G^{(3)} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, -\infty \leq x_3 \leq \infty; \quad U(y_1, 0, y_3) = s_2(y_1, 0, y_3)
\]

The Answer to Problem (P3C) 3.3 for quarter-space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 3.4

\[
G^{(4)} = 0; x_1 = 0, 0 \leq x_2 \leq \infty, -\infty \leq x_3 \leq \infty; \quad U(0, y_2, y_3) = s_1(0, y_2, y_3); \\
\frac{\partial G^{(4)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, -\infty \leq x_3 \leq \infty; \quad \partial U(y_1, 0, y_3) = g_2(y_1, 0, y_3)
\]

The Answer to Problem (P3C) 3.4 for quarter-space (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C)4. Octant \(0 \leq x_1, x_2, x_3 \leq \infty\)

This Section formulates eight boundary-value Problem (P3C) s on constructing Green’s functions, \(G^{(j)}, j = 1 \rightarrow 8\) of Poisson’s equation for the octant.
Problem (P3C) 4.1–(P3C)4.8

Let us consider the following boundary value problem (P3C) which consists from the Poisson equation

\[ \nabla^2 G(x_1, \xi_1; x_2, \xi_2) = -\delta(x - \xi); \]
\[ \nabla^2 U(x_1, x_2) = -f(x_1, x_2). \]

in the inner points of the octant. At infinity the functions \( G \) and \( U \) must vanish.

To construct the Green’s functions \( G^{(j)}, j = 1 \ldots 8 \), for Poisson’s equation \( \nabla^2 G(x, \xi) = -\delta(x - \xi) \)

for the octant \( (0 \leq x_1, x_2, x_3 \leq \infty) \) under the following homogeneous boundary conditions:

\begin{align*}
G^{(1)} &= 0; x_1 = 0, 0 \leq x_2, x_3 \leq \infty; \quad U(0, y_2, y_3) = s_1(0, y_2, y_3), \\
G^{(2)} &= 0; x_2 = 0, 0 \leq x_1, x_3 \leq \infty; \quad U(y_1, 0, y_3) = s_2(y_1, 0, y_3), \\
G^{(3)} &= 0; x_3 = 0, 0 \leq x_1, x_2 \leq \infty; \quad U(y_1, y_2, 0) = s_3(y_1, y_2, 0).
\end{align*}

The Answer to Problem (P3C) 4.1 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 4.2

\[ \frac{\partial G^{(2)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq \infty; 0 \leq x_3 \leq \infty; \quad \frac{\partial U(0, y_2, y_3)}{\partial n_1} = s_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(2)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq \infty; 0 \leq x_3 \leq \infty; \quad \frac{\partial U(y_1, 0, y_3)}{\partial n_2} = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(2)}}{\partial x_3} = 0; x_3 = 0, 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty; \quad \frac{\partial U(y_1, y_2, 0)}{\partial n_3} = s_3(y_1, y_2, 0). \]

The Answer to Problem (P3C) 4.2 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 4.3
\[ G^{(3)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq \infty; \quad U(0, y_2, y_3) = s_1(0, y_2, y_3); \]
\[ G^{(3)} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq \infty; \quad U(y_1, 0, y_3) = s_2(y_1, 0, y_3); \]
\[ \partial G^{(3)}/\partial x_3 = 0; \quad x_3 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty; \quad \partial U(y_1, y_2, 0)/\partial n_3 = s_3(y_1, y_2, 0). \]

The Answer to Problem (P3C) 4.3 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 4.4
\[ G^{(4)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq \infty; \quad U(0, y_2, y_3) = s_1(0, y_2, y_3); \]
\[ \partial G^{(4)}/\partial x_2 = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq \infty; \quad \partial U(y_1, 0, y_3)/\partial n_2 = s_2(y_1, 0, y_3); \]
\[ \partial G^{(4)}/\partial x_3 = 0; \quad x_3 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty; \quad \partial U(y_1, y_2, 0)/\partial n_3 = s_3(y_1, y_2, 0). \]

The Answer to Problem (P3C) 4.4 for octant (Green’s function for Poisson’s equation in Cartesian coordinates)

Problem (P3C) 4.5
\[ \partial G^{(5)}/\partial x_1 = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq \infty; \quad \partial U(0, y_2, y_3)/\partial n_1 = s_1(0, y_2, y_3); \]
\[ G^{(5)} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq \infty; \quad U(y_1, 0, y_3) = s_2(y_1, 0, y_3); \]
\[ G^{(5)} = 0; \quad x_3 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty; \quad U(y_1, y_2, y_3) = s_3(y_1, y_2, y_3). \]

The Answer to Problem (P3C) 4.5 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 4.6
\[ \partial G^{(6)}/\partial x_1 = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq \infty; \quad \partial U(0, y_2, y_3)/\partial n_1 = s_1(0, y_2, y_3); \]
\[ \partial G^{(6)}/\partial x_2 = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq \infty; \quad \partial U(y_1, 0, y_3)/\partial n_2 = s_2(y_1, 0, y_3); \]
\[ G^{(6)} = 0; \quad x_3 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty. \quad U(y_1, y_2, y_3) = s_3(y_1, y_2, y_3). \]

The Answer to Problem (P3C) 4.6 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 4.7

\[
\frac{\partial G^{(7)}}{\partial x_1} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq \infty; \quad \partial U(0, y_2, y_3)/\partial n_1 = s_1(0, y_2, y_3);
\]

\[
\frac{\partial G^{(7)}}{\partial x_3} = 0; \quad x_3 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty; \quad \partial U(y_1, 0, y_3)/\partial n_1 = s_2(y_1, 0, y_3);
\]

\[
G^{(7)} = 0, x_2 = 0, \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq \infty; \quad U(y_1, 0, y_3) = s_2(y_1, 0, y_3);
\]

The Answer to Problem (P3C) 4.7 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 4.8

\[
\frac{\partial G^{(8)}}{\partial x_2} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq \infty; \quad \partial U(y_1, 0, y_3)/\partial n_2 = s_2(y_1, 0, y_3);
\]

\[
\frac{\partial G^{(8)}}{\partial x_3} = 0; \quad x_3 = 0, \quad 0 \leq x_2 \leq \infty, 0 \leq x_1 \leq \infty; \quad U(y_1, y_2, 0) = s_3(y_1, y_2, 0);
\]

The Answer to Problem (P3C) 4.8 for octant (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C)5. Layer \((-\infty \leq x_1, x_2 \leq \infty, 0 \leq x_3 \leq a_3\))

This section formulates four boundary-value Problem (P3C) s on constructing Green’s functions, \(G^{(j)}, (j = 1 - 4)\), of Poisson’s equation for the layer

![Layer diagram](image)

Figure 5: Layer with boundary planes \(\Gamma_0\) and \(\Gamma_1\).

Problems (P3C) 5.1–(P3C) 5.4

Let us consider the following boundary value Problem (P3C) s which consist from the Poisson equation

\[
\nabla^2 G(x_1, x_2; x_1, x_2) = -\delta(x - \xi);
\]

\[
\nabla^2 U(x_1, x_2) = -f(x_1, x_2).
\]
in the inner points of the octant. At infinity the functions $G$ and $U$ must vanish.

To construct the Green’s functions $G^{(j)}(x, \xi)$, $(j = 1 - 4)$ for Poisson’s equation $\nabla^2 G^{(j)}(x, \xi) = -\delta(x - \xi)$ for the layer $(-\infty \leq x_1, x_2 \leq \infty, 0 \leq x_3 \leq a_j)$ under the following homogeneous boundary conditions:

**Problem (P3C) 5.1**

\[
G^{(1)} = 0; x_3 = 0, -\infty \leq x_1, x_2 \leq \infty; \quad U(y_1, y_2, 0) = s_3(y_1, y_2, 0); \\
G^{(1)} = 0; x_3 = a_3, -\infty \leq x_1, x_2 \leq \infty; \quad U(y_1, y_2, a_3) = s_3^\prime(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 5.1 for layer (Green’s function for Poisson’s equation in Cartesian coordinates)
can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 5.2**

\[
\frac{\partial G^{(2)}}{\partial x_3} = 0; x_3 = 0, -\infty \leq x_1, x_2 \leq \infty; \quad \frac{\partial U(y_1, y_2, 0)}{\partial n_3} = g_3(y_1, y_2, 0); \\
\frac{\partial G^{(2)}}{\partial x_3} = 0; x_3 = a_3, -\infty \leq x_1, x_2 \leq \infty; \quad \frac{\partial U(y_1, y_2, 0)}{\partial n_3} = g_3^\prime(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 5.2 for layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 5.3**

\[
G^{(3)} = 0, x_3 = 0, -\infty \leq x_3 \leq \infty; \quad U(y_1, y_2, 0) = s_3(y_1, y_2, 0); \\
\frac{\partial G^{(3)}}{\partial x_3} = 0, x_3 = a_3, -\infty \leq x_3 \leq \infty; \quad \frac{\partial U(y_1, y_2, 0)}{\partial n_3} = g_3^\prime(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 5.3 for layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 5.4**

\[
\frac{\partial G^{(4)}}{\partial x_3} = 0; x_3 = 0, -\infty \leq x_1, x_2 \leq \infty; \quad \frac{\partial U(y_1, y_2, 0)}{\partial n_3} = g_3(y_1, y_2, 0); \\
G^{(4)} = 0; x_3 = a_3, -\infty \leq x_1, x_2 \leq \infty; \quad U(y_1, y_2, a_3) = s_3^\prime(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 5.4 for layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**(P3C) 6. Half-layer**

$0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3$
This section formulates eight boundary-value Problem (P3C) s on constructing Green’s functions, $G^{(j)}(j = 1–8)$, of Poisson’s equation for the half-layer

![Figure 6: Half-layer with boundary half-planes $\Gamma_{30}$, $\Gamma_{31}$ and boundary strip $\Gamma_{10}$.

Problems (P3C) 6.1–(P3C) 6.8

Let us consider the following boundary value Problem (P3C) s which consist from the Poisson equation

\[
\nabla^2 G(x_1, x_2; x_1', x_2') = -\delta(x - x'); \\
\nabla^2 U(x_1, x_2) = -f(x_1, x_2).
\]

in the inner points of the half-layer. At infinity the functions $G$ and $U$ must vanish.

To construct the Green’s functions $G^{(j)}(x, \xi)(j = 1–8)$ for Poisson’s equation $\nabla^2 G^{(j)}(x, \xi)$ $= -\delta(x - \xi)$ for the half-layer $0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3$ under the following homogeneous boundary conditions:

Problem (P3C) 6.1

\[
G^{(1)} = 0; \quad \begin{cases} 
  x_1 = 0; \quad -\infty \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \\
  x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \quad -\infty \leq x_2 \leq \infty; \quad U = s_3(y_1, y_2, 0);
\end{cases}
\]

The Answer to Problem (P3C) 6.1 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 6.2

\[
\partial G^{(2)} / \partial x_1 = 0; \quad x_1 = 0, \quad -\infty \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad \partial U / \partial y_1 = g_1(0, y_2, y_3); \\
\partial G^{(2)} / \partial x_3 = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, \quad -\infty \leq x_2 \leq \infty; \quad \partial U / \partial y_3 = g_3(y_1, y_2, 0); \\
\partial G^{(2)} / \partial x_3 = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \quad -\infty \leq x_2 \leq \infty; \quad \partial U / \partial y_3 = g_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 6.2 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
### Problem (P3C) 6.3

\[ G^{(3)} = 0; \; x_1 = 0, -\infty \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \; U = s_1(0, y_2, y_3) \]

\[ \partial G^{(3)}/\partial x_3 = 0; \; x_3 = 0; 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]

\[ \partial G^{(3)}/\partial x_3 = 0; \; x_3 = a_3; 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; \partial U/\partial y_3 = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 6.3 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

### Problem (P3C) 6.4

\[ G^{(4)} = 0; \; \begin{cases} x_1 = 0, -\infty \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \; U = s_1(0, y_2, y_3) \; \text{;} \\ x_3 = 0, 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; U = s_3(y_1, y_2, 0) \; \text{;} \\ \end{cases} \]

\[ \partial G^{(4)}/\partial x_3 = 0; \; x_3 = a_3; 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; \partial U/\partial y_3 = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 6.4 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

### Problem (P3C) 6.5

\[ G^{(5)} = 0; \; \begin{cases} x_1 = 0, -\infty \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \; U = s_1(0, y_2, y_3) \; \text{;} \\ x_3 = a_3, 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; U = s_3'(y_1, y_2, a_3) \; \text{;} \\ \end{cases} \]

\[ \partial G^{(5)}/\partial x_3 = 0; \; x_3 = 0; 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; \partial U/\partial y_3 = g_3'(y_1, y_2, 0). \]

The Answer to Problem (P3C) 6.5 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

### Problem (P3C) 6.6

\[ \partial G^{(6)}/\partial x_1 = 0; \; x_1 = 0, -\infty \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \; \partial U/\partial y_1 = g_1(0, y_2, y_3); \]

\[ G^{(6)} = 0; \; x_3 = 0; 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; U = s_3(y_1, y_2, 0); \]

\[ G^{(6)} = 0; \; x_3 = a_3; 0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty; \; U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 6.6 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
The Answer to Problem (P3C) 6.7 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

The Answer to Problem (P3C) 6.8 for half-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C) 7. Quarter-layer \(0 \leq x_1, x_2 \leq \infty, 0 \leq x_3 \leq a_3\)

This Section formulates 16 boundary-value Problem (P3C)s on constructing Green’s functions, \(G^{(j)}, (j = 1–16)\), of Poisson’s equation for the quarter-layer

Figure 7: Quarter-layer with boundary quadrants \(\Gamma_{30}, \Gamma_{31}\) and boundary half-strips \(\Gamma_{10}, \Gamma_{20}\)

Problems (P3C)7.1– (P3C) 7.16

To construct the Green’s functions \(G^{(j)}(x, \xi), (j = 1–16)\) for Poisson’s equation \(\nabla^2 G^{(j)}(x, \xi) = -\delta(x - \xi)\) for the quarter-layer \(0 \leq x_1, x_2 \leq \infty, 0 \leq x_3 \leq a_3\) under the following homogeneous boundary conditions:
The Answer to Problem (P3C) 7.1 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.2
\[ \frac{\partial G^{(2)}}{\partial x} = 0; \quad x = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(2)}}{\partial x} = 0; \quad x = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(2)}}{\partial x} = 0; \quad x = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 7.2 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.3
\[ G^{(3)} = 0; \quad x = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]
\[ G^{(3)} = 0; \quad x = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(3)}}{\partial x} = 0; \quad x = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 7.3 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.4
\[ G^{(4)} = 0; \quad x = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]
\[ G^{(4)} = 0; \quad x = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(4)}}{\partial x} = 0; \quad x = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 7.4 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 7.5
\[ G^{(5)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]
\[ G^{(5)} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ \partial G^{(5)}/\partial x_3 = 0; \quad x_3 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]
\[ G^{(5)} = 0; \quad x_3 = a_3, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad U = s'_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.5 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.6
\[ G^{(6)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]
\[ \partial G^{(6)}/\partial x_2 = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ \partial G^{(6)}/\partial x_3 = 0; \quad x_3 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]
\[ \partial G^{(6)}/\partial x_3 = 0; \quad x_3 = a_3, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad U = s'_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.6 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.7
\[ G^{(7)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad s_1(0, y_2, y_3); \]
\[ \partial G^{(7)}/\partial x_2 = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ G^{(7)} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad U = s_3(y_1, y_2, 0); \]
\[ G^{(7)} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad U = s'_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.7 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.8
\[ G^{(8)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad s_1(0, y_2, y_3); \]
\[ \partial G^{(8)}/\partial x_2 = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ G^{(8)} = 0; \quad x_3 = 0, \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq \infty; \quad U = s_3(y_1, y_2, 0); \]
\[ \partial G^{(8)}/\partial x_3 = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \quad 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.8 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 7.9

\[ G^{(9)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_1(y_1, y_2, y_3); \]
\[ \frac{\partial G^{(9)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(9)}}{\partial x_3} = 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_3; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]
\[ G^{(9)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.9 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.10

\[ \frac{\partial G^{(10)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(10)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ G^{(10)} = 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad U = s_3(y_1, y_2, 0); \]
\[ G^{(10)} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.10 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.11

\[ \frac{\partial G^{(11)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(11)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ G^{(11)} = 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad U = s_3(y_1, y_2, 0); \]
\[ \frac{\partial G^{(11)}}{\partial x_3} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 7.11 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.12

\[ \frac{\partial G^{(12)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(12)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial y_2 = g_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(12)}}{\partial x_3} = 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad \partial U/\partial y_3 = g_3(y_1, y_2, 0); \]
\[ G^{(12)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty; \quad U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 7.12 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 7.13
\[
\frac{\partial G^{(13)}}{\partial x_1} = 0; \quad x_1 = 0, \ 0 \leq x_2 \leq \infty, \ 0 \leq x_3 \leq a_3; \ \frac{\partial U}{\partial y_1} = g_1(0, y_2, y_3);
\]
\[
G^{(13)} = 0; \quad x_2 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3);
\]
\[
G^{(13)} = 0; \quad x_3 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad U = s_3(y_1, y_2, 0);
\]
\[
G^{(13)} = 0; \quad x_3 = a_3, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad U = s'_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 7.13 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.14
\[
\frac{\partial G^{(14)}}{\partial x_1} = 0; \quad x_1 = 0, \ 0 \leq x_2 \leq \infty, \ 0 \leq x_3 \leq a_3; \ \frac{\partial U}{\partial y_1} = g_1(0, y_2, y_3);
\]
\[
G^{(14)} = 0; \quad x_2 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3);
\]
\[
\frac{\partial G^{(14)}}{\partial x_3} = 0; \quad x_3 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad \frac{\partial U}{\partial y_3} = g_3(y_1, y_2, 0);
\]
\[
\frac{\partial G^{(14)}}{\partial x_3} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad \frac{\partial U}{\partial y_3} = g'_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 7.14 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.15
\[
\frac{\partial G^{(15)}}{\partial x_1} = 0; \quad x_1 = 0, \ 0 \leq x_2 \leq \infty, \ 0 \leq x_3 \leq a_3; \ \frac{\partial U}{\partial y_1} = g_1(0, y_2, y_3);
\]
\[
G^{(15)} = 0; \quad x_2 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3);
\]
\[
G^{(15)} = 0; \quad x_3 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad U = s_3(y_1, y_2, 0);
\]
\[
\frac{\partial G^{(15)}}{\partial x_3} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad \frac{\partial U}{\partial y_3} = g'_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 7.15 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 7.16
\[
\frac{\partial G^{(16)}}{\partial x_1} = 0; \quad x_1 = 0, \ 0 \leq x_2 \leq \infty, \ 0 \leq x_3 \leq a_3; \ \frac{\partial U}{\partial y_1} = g_1(0, y_2, y_3);
\]
\[
G^{(16)} = 0; \quad x_2 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3);
\]
\[
\frac{\partial G^{(16)}}{\partial x_3} = 0; \quad x_3 = 0, \ 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad \frac{\partial U}{\partial y_3} = g_3(y_1, y_2, 0);
\]
\[
\frac{\partial G^{(16)}}{\partial x_3} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, \ 0 \leq x_2 \leq \infty; \quad U = s'_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 7.16 for quarter-layer (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
**P3C\(8\). Unbounded Parallelepiped \((-\infty \leq x_1 \leq \infty; 0 \leq x_2 \leq a_2; 0 \leq x_3 \leq a_3\)**

In this section formulates 16 boundary-value Problem (P3C) on constructing Green’s functions, \(G^{(j)}\), \((j = 1-16)\), of Poisson’s equation for the unbounded parallelepiped

![Diagram of unbounded parallelepiped](image)

Figure 8: Unbounded parallelepiped with boundary strips \(\Gamma_{20}, \Gamma_{21}\) and \(\Gamma_{30}, \Gamma_{31}\).

**Problems (P3C) 8.1 – (P3C) 8.16**

To construct the Green’s functions \(G^{(j)}\), \((j = 1-16)\) of Poisson’s equation \(\nabla^2 G^{(j)}(x, \xi) = -\delta(x - \xi)\) for the unbounded parallelepiped \((-\infty \leq x_1 \leq \infty; 0 \leq x_2 \leq a_2; 0 \leq x_3 \leq a_3\)** under the following homogeneous boundary conditions:

<table>
<thead>
<tr>
<th>Problem (P3C) 8.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(G^{(1)} = 0; x_2 = 0; -\infty \leq x_1 \leq \infty; 0 \leq x_3 \leq a_3; U = s_1(y_1, 0, y_3));</td>
</tr>
<tr>
<td>(G^{(1)} = 0; x_3 = 0; -\infty \leq x_1 \leq \infty; 0 \leq x_2 \leq a_2; U = s_2(y_1, a_2, y_3));</td>
</tr>
<tr>
<td>(G^{(1)} = 0; x_3 = a_3; -\infty \leq x_1 \leq \infty; 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3));</td>
</tr>
</tbody>
</table>

The Answer to Problem (P3C) 8.1 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.2**

\[
\begin{align*}
\partial G^{(2)} / \partial x_2 = 0; x_2 = 0; -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 & = g_2(y_1, 0, y_3); \\
\partial G^{(2)} / \partial x_2 = 0; x_2 = a_2; -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2' & = g'_2(y_1, 0, y_3); \\
\partial G^{(2)} / \partial x_3 = 0; x_3 = 0; -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 & = g_3(y_1, y_2, 0); \\
\partial G^{(2)} / \partial x_3 = 0; x_3 = a_3; -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3' & = g'_3(y_1, y_2, 0).
\end{align*}
\]
The Answer to Problem (P3C) 8.2 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.3**

\[ G^{(3)} = 0; \ x_2 = 0; \ \infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1,0,y_3); \]

\[ G^{(3)} = 0; \ x_2 = a_2; \ \infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2'(y_1,a_2,y_3); \]

\[ \partial G^{(3)}/\partial x_3 = 0; \ x_3 = 0; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3'(y_1,y_2,0); \]

\[ \partial G^{(3)}/\partial x_3 = a_3; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3'(y_1,y_2,0); \]

The Answer to Problem (P3C) 8.3 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.4**

\[ \partial G^{(4)}/\partial x_2 = 0; \ x_2 = 0; \ \infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1,0,y_3); \]

\[ \partial G^{(4)}/\partial x_2 = 0; \ x_2 = a_2; \ \infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2'(y_1,0,y_3); \]

\[ G^{(4)} = 0; \ x_3 = 0; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1,y_2,0); \]

\[ G^{(4)} = 0; \ x_3 = a_3; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1,y_2,a_3); \]

The Answer to Problem (P3C) 8.4 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.5**

\[ G^{(5)} = 0; \ x_2 = 0, \ \infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3 U = s_2(y_1,0,y_3); \]

\[ \partial G^{(5)}/\partial x_2 = 0; \ x_2 = a_2; \ \infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2'(y_1,0,y_3); \]

\[ G^{(5)} = 0; x_3 = 0, a_3; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1,y_2,0); \]

\[ G^{(5)} = 0; x_3 = a_3; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1,y_2,a_3); \]

The Answer to Problem (P3C) 8.5 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.6**

\[ \partial G^{(6)}/\partial x_2 = 0; \ x_2 = 0, \ \infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1,0,y_3); \]

\[ G^{(6)} = 0; x_2 = a_2, \ \infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2'(y_1,a_2,y_3); \]

\[ \partial G^{(6)}/\partial x_3 = 0; x_3 = 0, a_3; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1,y_2,0); \]

\[ \partial G^{(6)}/\partial x_3 = 0; x_3 = 0, a_3; \ \infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3'(y_1,y_2,0). \]
The Answer to Problem (P3C) 8.6 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 8.7

\[ \begin{align*}
G^{(7)} &= 0; \ x_2 = 0, \ \ -\infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \ U = s_2(y_1,0, y_3); \\
\partial G^{(7)}/\partial x_2 &= 0; x_2 = a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \ \frac{\partial U}{\partial n_2} = g_2^/'(y_1,0, y_3); \\
\partial G^{(7)}/\partial x_3 &= 0; x_3 = 0, a_3; -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ \partial U/\partial n_3 = g_3^/(y_1, y_2,0); \\
\partial G^{(7)}/\partial x_3 &= 0; x_3 = 0, a_3; -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ \partial U/\partial n_3^/' = g_3^/(y_1, y_2,0).
\end{align*} \]

The Answer to Problem (P3C) 8.7 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 8.8

\[ \begin{align*}
\partial G^{(7)}(\partial x_2 &= 0; x_2 = 0, \ -\infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \ \partial U/\partial n_2 = g_2(y_1,0, y_3); \\
G^{(8)}(x_2 &= a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \ U = s_2^/(y_1,a_2, y_3); \\
G^{(8)}(x_3 &= 0, a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ U = s_3(y_1, y_2,0); \\
G^{(8)}(x_3 &= 0, a_3; -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ U = s_3^/(y_1, y_2, a_3).
\end{align*} \]

The Answer to Problem (P3C) 8.8 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 8.9

\[ \begin{align*}
G^{(9)} &= 0; \ x_2 = 0, a_2, -\infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \ U = s_2(y_1,0, y_3); \\
G^{(9)} &= 0; \ x_2 = a_2, -\infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \ U = s_2^/(y_1,a_2, y_3); \\
\partial G^{(9)}/\partial x_3 &= 0; x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ \partial U/\partial n_3 = g_3(y_1, y_2,0); \\
G^{(9)} &= 0, x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ U = s_3^/(y_1, y_2, a_3).
\end{align*} \]

The Answer to Problem (P3C) 8.9 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 8.10

\[ \begin{align*}
G^{(10)} &= 0; \ x_2 = 0, a_2, -\infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \ U = s_2(y_1,0, y_3); \\
G^{(10)} &= 0; \ x_2 = 0, a_2, -\infty \leq x_1 \leq \infty, \ 0 \leq x_3 \leq a_3; \ U = s_2^/(y_1,a_2, y_3); \\
G^{(10)} &= 0; \ x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ U = s_3(y_1, y_2,0); \\
\partial G^{(10)}/\partial x_3 &= 0; x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \ \partial U/\partial n_3' = g_3(y_1, y_2,0).
\end{align*} \]
The Answer to Problem (P3C) 8.10 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.11**

\[
\begin{align*}
\frac{\partial G^{(1)}}{\partial x_2} &= 0; \quad x_2 = 0; -\infty \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2(y_1,0,y_3); \\
\frac{\partial G^{(1)}}{\partial x_2} &= 0; \quad x_2 = a_2; -\infty \leq x_1 \leq \infty, \quad 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g'_2(y_1,0,y_3); \\
G^{(1)} &= 0; \quad x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1,y_2,0); \\
\frac{\partial G^{(1)}}{\partial x_3} &= 0, x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g'_3(y_1,y_2,0).
\end{align*}
\]

The Answer to Problem (P3C) 8.11 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.12**

\[
\begin{align*}
G^{(12)} &= 0; \quad x_2 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1,0,y_3); \\
\frac{\partial G^{(12)}}{\partial x_2} &= 0; \quad x_2 = a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2(y_1,0,y_3); \\
G^{(12)} &= 0; \quad x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1,y_2,0); \\
\frac{\partial G^{(12)}}{\partial x_3} &= 0, x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g'_3(y_1,y_2,0).
\end{align*}
\]

The Answer to Problem (P3C) 8.12 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.13**

\[
\begin{align*}
\frac{\partial G^{(13)}}{\partial x_3} &= 0; \quad x_2 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2(y_1,0,y_3); \\
G^{(13)} &= 0; \quad x_2 = a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s'_2(y_1,a_2,y_3); \\
G^{(13)} &= 0; \quad x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1,y_2,0); \\
\frac{\partial G^{(13)}}{\partial x_3} &= 0, x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g'_3(y_1,y_2,0).
\end{align*}
\]

The Answer to Problem (P3C) 8.13 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.14**

\[
\begin{align*}
\frac{\partial G^{(14)}}{\partial x_2} &= 0; \quad x_2 = 0, a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2(y_1,0,y_3); \\
\frac{\partial G^{(14)}}{\partial x_2} &= 0; \quad x_2 = a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g'_2(y_1,0,y_3); \\
\frac{\partial G^{(14)}}{\partial x_3} &= 0; x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g_3(y_1,y_2,0); \\
G^{(14)} &= 0, \quad x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s'_3(y_1,y_2,a_3).
\end{align*}
\]

The Answer to Problem (P3C) 8.14 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
The Answer to Problem (P3C) 8.14 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.15**

\[
G^{(15)} = 0; \quad x_2 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3);
\]

\[
\partial G^{(15)}/\partial x_2 = 0; \quad x_2 = a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2'(y_1, 0, y_3);
\]

\[
\partial G^{(15)}/\partial x_3 = 0; \quad x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(15)} = 0, x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 8.15 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 8.16**

\[
\partial G^{(16)}/\partial x_2 = 0; \quad x_2 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]

\[
G^{(16)} = 0; \quad x_2 = a_2, -\infty \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, a_2, y_3);
\]

\[
\partial G^{(16)}/\partial x_3 = 0; \quad x_3 = 0, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_2 = g_3(y_1, y_2, 0);
\]

\[
G^{(16)} = 0, x_3 = a_3, -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 8.16 for unbounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**P3C9. Semi-bounded Parallelepiped**

(0 \leq x_1 \leq \infty; 0 \leq x_2 \leq a_2; 0 \leq x_3 \leq a_3)

This section formulates thirty two boundary-value Problem (P3C) s on constructing Green’s functions, \(G^{(j)}, (j = 1 - 32),\) of Poisson’s equation for the semi-bounded parallelepiped

![Figure 9: Semi-bounded parallelepiped with boundary half-strips \(\Gamma_{20}, \Gamma_{21}, \Gamma_{30}, \Gamma_{31}\) and boundary rectangular \(\Gamma_{10}\).](image-url)
Problems (P3C) 9.1–(P3C)9.32
To construct the Green’s functions $G^{(j)}(x, \xi)$, ($j = 1–32$) of Poisson’s equation
\[ \nabla^2 G^{(j)}(x, \xi) = -\delta(x-\xi) \]
for the semi-bounded parallelepiped $\{0 \leq x_1 \leq \infty; 0 \leq x_2 \leq a_2; 0 \leq x_3 \leq a_3\}$
under the following homogeneous boundary conditions:

**Problem (P3C) 9.1**

\[
\begin{align*}
G^{(1)} &= 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \\
G^{(2)} &= 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2\left(y_1, 0, y_3\right); \\
G^{(3)} &= 0; \quad x_2 = a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_3'\left(y_1, a_2, y_3\right); \\
G^{(4)} &= 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'\left(y_1, y_2, a_3\right).
\end{align*}
\]

The Answer to Problem (P3C) 9.1 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 9.2**

\[
\begin{align*}
\partial G^{(2)}/\partial x_1 &= 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
\partial G^{(2)}/\partial x_2 &= 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2\left(y_1, 0, y_3\right); \\
\partial G^{(2)}/\partial x_2 &= 0; \quad x_2 = a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2\left(y_1, a_2, y_3\right); \\
\partial G^{(2)}/\partial x_3 &= 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(0, y_2, y_3); \\
\partial G^{(2)}/\partial x_3 &= 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3\left(y_1, y_2, a_3\right).
\end{align*}
\]

The Answer to Problem (P3C) 9.2 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 9.3**

\[
\begin{align*}
G^{(3)} &= 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \\
G^{(3)} &= 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(0, y_2, y_3); \\
G^{(3)} &= 0; \quad x_2 = a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_3(0, y_2, y_3); \\
\partial G^{(3)}/\partial x_3 &= 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(0, y_2, y_3); \\
\partial G^{(3)}/\partial x_3 &= 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3\left(y_1, y_2, a_3\right).
\end{align*}
\]

The Answer to Problem (P3C) 9.3 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 9.4

\[ \frac{\partial G^{(4)}}{\partial x_1} = 0; \quad x_1 = 0.0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_1 = g_1(0, y_2, y_3); \]

\[ G^{(4)} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]

\[ G^{(4)} = 0; \quad x_2 = a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s'_2(y_1, a_2, y_3); \]

\[ \frac{\partial G^{(4)}}{\partial x_3} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U / \partial n_3 = g_3(x_1, y_2, 0); \]

\[ \frac{\partial G^{(4)}}{\partial x_3} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U / \partial n_3 = g'_3(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 9.4 for **semi-bounded parallelepiped** (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.5

\[ G^{(5)} = 0; \quad x_1 = 0.0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]

\[ \frac{\partial G^{(5)}}{\partial x_2} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g_2(y_1, 0, y_3); \]

\[ \frac{\partial G^{(5)}}{\partial x_2} = 0; \quad x_2 = a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g'_2(y_1, a_2, y_3); \]

\[ G^{(5)} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

\[ G^{(5)} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s'_3(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 9.5 for **semi-bounded parallelepiped** (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.6

\[ \frac{\partial G^{(6)}}{\partial x_1} = 0; \quad x_1 = 0.0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_1 = g_1(0, y_2, y_3); \]

\[ \frac{\partial G^{(6)}}{\partial x_2} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g_2(y_1, 0, y_3); \]

\[ \frac{\partial G^{(6)}}{\partial x_2} = 0; \quad x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g'_2(y_1, a_2, y_3); \]

\[ G^{(6)} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

\[ G^{(6)} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s'_3(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 9.6 for **semi-bounded parallelepiped** (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.7

\[ G^{(7)} = 0; \quad x_1 = 0.0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]

\[ G^{(7)} = 0; \quad x_2 = 0.0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]

\[ \frac{\partial G^{(7)}}{\partial x_2} = 0; \quad x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g'_2(y_1, a_2, y_3); \]

\[ G^{(7)} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

\[ G^{(7)} = 0; \quad x_3 = a_3; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s'_3(y_1, y_2, a_3); \]
The Answer to Problem (P3C) 9.7 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 9.8**

\[
\begin{align*}
\frac{\partial G^{(8)}}{\partial x_1} &= 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
G^{(8)} &= 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \\
\frac{\partial G^{(8)}}{\partial x_2} &= 0; \quad x_2 = a_2, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3); \\
G^{(8)} &= 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \\
\frac{\partial G^{(8)}}{\partial x_3} &= 0; \quad x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1, y_2, a_3);
\end{align*}
\]

The Answer to Problem (P3C) 9.8 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 9.9**

\[
\begin{align*}
G^{(9)} &= 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \\
\frac{\partial G^{(9)}}{\partial x_2} &= 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3); \\
G^{(9)} &= 0; \quad x_2 = a_2, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_2; \quad U = s_2(y_1, a_2, y_3); \\
\frac{\partial G^{(9)}}{\partial x_3} &= 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0); \\
\frac{\partial G^{(9)}}{\partial x_3} &= 0; \quad x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3'(y_1, y_2, a_3);
\end{align*}
\]

The Answer to Problem (P3C) 9.9 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 9.10**

\[
\begin{align*}
\frac{\partial G^{(10)}}{\partial x_1} &= 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
\frac{\partial G^{(10)}}{\partial x_2} &= 0; \quad x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3); \\
G^{(10)} &= 0; \quad x_2 = a_2, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_2; \quad U = s_2(y_1, a_2, y_3); \\
\frac{\partial G^{(10)}}{\partial x_3} &= 0; \quad x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0); \\
\frac{\partial G^{(10)}}{\partial x_3} &= 0; \quad x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3'(y_1, y_2, a_3);
\end{align*}
\]

The Answer to Problem (P3C) 9.10 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 9.11
\[ G^{(1)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ G^{(1)} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \partial G^{(1)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2'(y_1, a_2, y_3); \]
\[ \partial G^{(1)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ \partial G^{(1)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 9.11 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.12
\[ \partial G^{(12)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(12)} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \partial G^{(12)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2'(y_1, a_2, y_3); \]
\[ \partial G^{(12)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ \partial G^{(12)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 9.12 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.13
\[ G^{(13)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \partial G^{(13)}/\partial x_2 = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ G^{(13)} = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ G^{(13)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ G^{(13)} = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 9.13 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.14
\[ \partial G^{(14)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ \partial G^{(14)}/\partial x_2 = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ G^{(14)} = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ G^{(14)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ G^{(14)} = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3). \]
The Answer to Problem (P3C) 9.14 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.15

\[
\begin{align*}
G^{(15)} &= 0; \ x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \\
G^{(15)} &= 0; \ x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \\
G^{(15)} &= 0; \ x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2^*(y_1, a_2, y_3); \\
\partial G^{(15)}/\partial x_3 &= 0; \ x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_2^* = g_3(y_1, y_2, 0); \\
G^{(15)} &= 0; \ x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3^*(y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 9.15 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.16

\[
\begin{align*}
\partial G^{(16)}/\partial x_1 &= 0; \ x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
G^{(16)} &= 0; \ x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \\
G^{(16)} &= 0; \ x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2^*(y_1, a_2, y_3); \\
\partial G^{(16)}/\partial x_3 &= 0; \ x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, a_2, y_3); \\
G^{(16)} &= 0; \ x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3^*(y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 9.16 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.17

\[
\begin{align*}
G^{(17)} &= 0; \ x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \\
G^{(17)} &= 0; \ x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \\
G^{(17)} &= 0; \ x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2^*(y_1, a_2, y_3); \\
\partial G^{(17)}/\partial x_3 &= 0; \ x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3^* = g_3^*(y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 9.17 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 9.18
\[ \partial G^{(18)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(18)} = 0; x_2 = 0, a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(18)} = 0; x_2 = 0, a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \]
\[ G^{(18)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ \partial G^{(18)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 9.18 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.19
\[ G^{(19)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \partial G^{(19)}/\partial x_2 = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ \partial G^{(19)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2'(y_1, a_2, y_3); \]
\[ G^{(19)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ \partial G^{(19)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 9.19 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.20
\[ \partial G^{(20)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ \partial G^{(20)}/\partial x_2 = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ \partial G^{(20)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2'(y_1, a_2, y_3); \]
\[ G^{(20)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ \partial G^{(20)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 9.20 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.21
\[ G^{(21)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ G^{(21)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \partial G^{(21)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2'(y_1, a_2, y_3); \]
\[ G^{(21)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ \partial G^{(21)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3). \]
The Answer to Problem (P3C) 9.21 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.22

\[
\begin{align*}
\frac{\partial G^{(22)}}{\partial x_1} &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3), \\
G^{(22)} &= 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3), \\
\frac{\partial G^{(22)}}{\partial x_2} &= 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2'(y_1, a_2, y_3), \\
G^{(22)} &= 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0), \\
\frac{\partial G^{(22)}}{\partial x_3} &= 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 9.22 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.23

\[
\begin{align*}
G^{(23)} &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3), \\
\frac{\partial G^{(23)}}{\partial x_2} &= 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3), \\
G^{(23)} &= 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3), \\
G^{(23)} &= 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0), \\
\frac{\partial G^{(23)}}{\partial x_3} &= 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 9.23 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.24

\[
\begin{align*}
\frac{\partial G^{(24)}}{\partial x_1} &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3), \\
\frac{\partial G^{(24)}}{\partial x_2} &= 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3), \\
G^{(24)} &= 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3), \\
G^{(24)} &= 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0), \\
\frac{\partial G^{(24)}}{\partial x_3} &= 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 9.24 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 9.25

\[
G^{(25)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]

\[
\partial G^{(25)}/\partial x_2 = 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]

\[
\partial G^{(25)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(25)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 9.25 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Serret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.26

\[
G^{(26)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]

\[
\partial G^{(26)}/\partial x_2 = 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]

\[
\partial G^{(26)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(26)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 9.26 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Serret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.27

\[
G^{(27)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]

\[
G^{(27)} = 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
\partial G^{(27)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2'(y_1, a_2, y_3);
\]

\[
\partial G^{(27)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(27)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 9.27 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Serret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.28

\[
\partial G^{(28)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]

\[
G^{(28)} = 0; x_2 = 0; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
\partial G^{(28)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2'(y_1, a_2, y_3);
\]

\[
\partial G^{(28)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(28)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 9.28 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Serret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
The Answer to Problem (P3C) 9.28 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.29

\[
G^{(29)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1 (0, y_2, y_3) \\
\frac{\partial G^{(29)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2 (y_1, 0, y_3) \\
G^{(29)} = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2' (y_1, a_2, y_3) \\
\frac{\partial G^{(29)}}{\partial x_3} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g_3 (y_1, y_2, 0) \\
G^{(29)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3' (y_1, y_2, a_3)
\]

The Answer to Problem (P3C) 9.29 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.30

\[
\frac{\partial G^{(30)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U / \partial n_1 = g_1 (0, y_2, y_3) \\
\frac{\partial G^{(30)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2 (y_1, 0, y_3) \\
G^{(30)} = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2' (y_1, a_2, y_3) \\
\frac{\partial G^{(30)}}{\partial x_3} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g_3 (y_1, y_2, 0) \\
G^{(30)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3' (y_1, y_2, a_3)
\]

The Answer to Problem (P3C) 9.30 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 9.31

\[
\frac{\partial G^{(31)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U / \partial n_1 = g_1 (0, y_2, y_3) \\
G^{(31)} = 0; x_2 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2 (y_1, 0, y_3) \\
G^{(31)} = 0; x_2 = a_2; 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; U = s_2' (y_1, a_2, y_3) \\
G^{(31)} = 0; x_3 = 0, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3 (y_1, y_2, 0) \\
G^{(31)} = 0; x_3 = a_3, 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; U = s_3' (y_1, y_2, a_3)
\]

The Answer to Problem (P3C) 9.31 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 9.32

\[
G^{(32)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3);
\]
\[
\frac{\partial G^{(32)}}{\partial x_2} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \frac{\partial U}{\partial n_2} = g_2(y_1, 0, y_3);
\]
\[
\frac{\partial G^{(32)}}{\partial x_3} = 0; \quad x_3 = 0; \quad 0 \leq x_2 \leq a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_3 \leq a_3; \quad \frac{\partial U}{\partial n_3} = g_3(y_1, y_2, 0);
\]
\[
\frac{\partial G^{(32)}}{\partial x_3} = 0; \quad x_3 = a_3; 0 \leq x_2 \leq a_2; \quad 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2; \quad \frac{\partial U}{\partial n_3} = g_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 9.32 for semi-bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

(P3C) 10. Bounded Parallelepiped

This section formulates sixty four boundary-value Problem (P3C) s on constructing Green’s functions, \(G^{(j)}\) \((j = 1 - 64)\), of Poisson’s equation for the bounded parallelepiped

![Figure 10: Bounded parallelepiped with boundary rectangular \(\Gamma_{10}, \Gamma_{11}, \Gamma_{20}, \Gamma_{21}\) and \(\Gamma_{30}, \Gamma_{31}\).](image)

Problems (P3C) 10.1–(P3C) 10.64

To construct the Green’s functions \(G^{(j)}(x, \xi)\) \((j = 1 - 64)\) for Poisson’s equation \(\nabla^2 G^{(j)}(x, \xi) = -\delta(x - \xi)\) for the bounded parallelepiped \((0 \leq x_1 \leq a_1; 0 \leq x_2 \leq a_2; 0 \leq x_3 \leq a_3)\) under the following homogeneous boundary conditions:
Problem (P3C) 10.1

\[
G^{(1)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, \quad 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]

\[
G^{(1)} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2, \quad 0 \leq x_3 \leq a_3; U = s_1'(a_1, y_2, y_3);
\]

\[
G^{(1)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, \quad 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
G^{(1)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, \quad 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3);
\]

\[
G^{(1)} = 0; x_3 = 0; 0 \leq x_1 \leq a_1, \quad 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0);
\]

\[
G^{(1)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, \quad 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.1 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.2

\[
G^{(2)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]

\[
G^{(2)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1'(a_1, y_2, y_3);
\]

\[
G^{(2)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
G^{(2)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3);
\]

\[
\partial G^{(2)}/\partial x_3 = 0; x_3 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
\partial G^{(2)}/\partial x_3 = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.2 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.3

\[
G^{(3)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, \quad 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]

\[
G^{(3)} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2, \quad 0 \leq x_3 \leq a_3; U = s_1'(a_1, y_2, y_3);
\]

\[
G^{(3)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, \quad 0 \leq x_3 \leq a_3; s_2(y_1, 0, y_3);
\]

\[
G^{(3)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, \quad 0 \leq x_3 \leq a_3; s_2'(y_1, a_2, y_3);
\]

\[
G^{(3)} = 0; x_3 = 0; 0 \leq x_1 \leq a_1, \quad 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0);
\]

\[
G^{(3)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, \quad 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.3 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.4

The Answer to Problem (P3C) 10.4 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.5

The Answer to Problem (P3C) 10.5 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.6

The Answer to Problem (P3C) 10.6 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.7

\[
\frac{\partial G}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]
\[
\frac{\partial G}{\partial x_2} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\frac{\partial G}{\partial x_3} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
\frac{\partial G}{\partial x_3} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_4 = g_4(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.7 for bounded parallelepiped (Green's function for Poisson's equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.8

\[
\frac{\partial G}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]
\[
\frac{\partial G}{\partial x_2} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\frac{\partial G}{\partial x_2} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\frac{\partial G}{\partial x_3} = 0; \quad x_1 = a_3, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
G = 0; x_3 = a_3; \quad 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.8 for bounded parallelepiped (Green's function for Poisson's equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.9

\[
G = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3);
\]
\[
G = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(a_1, y_2, y_3);
\]
\[
\frac{\partial G}{\partial x_2} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\frac{\partial G}{\partial x_2} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, a_2, y_3);
\]
\[
G = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0);
\]
\[
G = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.9 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.10
\[
G^{(10)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]
\[
G^{(10)} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1^*(a_1, y_2, y_3);
\]
\[
\partial G^{(10)}/\partial x_2 = 0; \quad x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\partial G^{(10)}/\partial x_2 = 0; \quad x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3);
\]
\[
\partial G^{(10)}/\partial x_3 = 0; \quad x_3 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
\partial G^{(10)}/\partial x_3 = 0; \quad x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 10.10 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.11
\[
G^{(11)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]
\[
G^{(11)} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1^*(a_1, y_2, y_3);
\]
\[
\partial G^{(11)}/\partial x_2 = 0; \quad x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\partial G^{(11)}/\partial x_2 = 0; \quad x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3);
\]
\[
\partial G^{(11)}/\partial x_3 = 0; \quad x_3 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
G^{(11)} = 0; \quad x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_1^*(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 10.11 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.12
\[
G^{(12)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3);
\]
\[
G^{(12)} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1^*(a_1, y_2, y_3);
\]
\[
\partial G^{(12)}/\partial x_2 = 0; \quad x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\partial G^{(12)}/\partial x_2 = 0; \quad x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3);
\]
\[
G^{(12)} = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0);
\]
\[
\partial G^{(12)}/\partial x_3 = 0; \quad x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, a_3).
\]

The Answer to Problem (P3C) 10.12 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.13

\[ \frac{\partial G^{(13)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(13)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1' = g_1'(a_1, y_2, y_3); \]
\[ G^{(13)} = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ G^{(13)} = 0; \quad x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad U = s_2'(y_1, a_2, y_3); \]
\[ G^{(13)} = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.13 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seretov V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.14

\[ \frac{\partial G^{(14)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(14)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1' = g_1'(a_1, y_2, y_3); \]
\[ G^{(14)} = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ G^{(14)} = 0; \quad x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad U = s_2'(y_1, a_2, y_3); \]
\[ G^{(14)} = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]
\[ G^{(14)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.14 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seretov V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.15

\[ \frac{\partial G^{(15)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(15)}}{\partial x_2} = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1' = g_1'(a_1, y_2, y_3); \]
\[ G^{(15)} = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ G^{(15)} = 0; \quad x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad U = s_2'(y_1, a_2, y_3); \]
\[ G^{(15)} = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]
\[ G^{(15)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.15 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seretov V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.16

\[ \frac{\partial G^{(16)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_1} = g_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(16)}}{\partial x_2} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_2'} = g_1'(a_1, y_2, y_3); \]
\[ G^{(16)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(16)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ \frac{\partial G^{(16)}}{\partial x_3} = 0; x_3 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \frac{\partial U}{\partial n_3} = g_3(y_1, y_2, 0); \]
\[ G^{(16)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.16 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.17

\[ G^{(17)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(17)}}{\partial x_1} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_1} = g_1(a_1, y_2, y_3); \]
\[ G^{(17)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(17)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ G^{(17)} = 0; x_3 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ G^{(17)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.17 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.18

\[ G^{(18)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \frac{\partial G^{(18)}}{\partial x_1} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_1} = g_1(a_1, y_2, y_3); \]
\[ G^{(18)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(18)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ \frac{\partial G^{(18)}}{\partial x_3} = 0; x_3 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \frac{\partial U}{\partial n_3} = g_3(y_1, y_2, 0); \]
\[ \frac{\partial G^{(18)}}{\partial x_3} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \frac{\partial U}{\partial n_3'} = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.18 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.19

\[
G^{(19)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(y_1, 0, y_3);
\]

\[
\frac{\partial G^{(19)}}{\partial x_1} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(a_1, y_2, y_3);
\]

\[
G^{(19)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
G^{(19)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2^1(y_1, a_2, y_3);
\]

\[
G^{(19)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
\frac{\partial G^{(19)}}{\partial x_2} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_3(y_1, a_2, y_3);
\]

\[
G^{(19)} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; d = g_3^1(y_1, y_2, 0);
\]

\[
G^{(19)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3^1(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.19 for bounded parallelepiped

Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.20

\[
G^{(20)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(y_1, 0, y_3);
\]

\[
\frac{\partial G^{(20)}}{\partial x_1} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(a_1, y_2, y_3);
\]

\[
G^{(20)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
G^{(20)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2^1(y_1, a_2, y_3);
\]

\[
\frac{\partial G^{(20)}}{\partial x_2} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_3(y_1, a_2, y_3);
\]

\[
G^{(20)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(20)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3^1(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.20 for bounded parallelepiped

Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.21

\[
\frac{\partial G^{(21)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]

\[
G^{(21)} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]

\[
\frac{\partial G^{(21)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]

\[
G^{(21)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2^1(y_1, a_2, y_3);
\]

\[
\frac{\partial G^{(21)}}{\partial x_3} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]

\[
G^{(21)} = 0; x_3 = a_3; 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0);
\]

\[
G^{(21)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3^1(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.21 for bounded parallelepiped

Poisson’s equation in Cartesian coordinates) can be found in the book: Seret V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.22
\[ \frac{\partial G^{(22)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(22)} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(22)}}{\partial x_2} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(22)}}{\partial x_3} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ G^{(22)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.22 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.23
\[ \frac{\partial G^{(23)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(23)} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(23)}}{\partial x_2} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(23)}}{\partial x_3} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ G^{(23)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.23 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.24
\[ \frac{\partial G^{(24)}}{\partial x_1} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(24)} = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(24)}}{\partial x_2} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(24)}}{\partial x_3} = 0; \quad x_3 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ G^{(24)} = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.24 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
**Problem (P3C) 10.25**

\[ G^{(25)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]

\[ \partial G^{(25)} / \partial x_1 = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_1' = g_1'(a_1, y_2, y_3); \]

\[ \partial G^{(25)} / \partial x_2 = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g_2(y_1, 0, y_3); \]

\[ \partial G^{(25)} / \partial x_3 = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.25 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 10.26**

\[ G^{(26)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]

\[ \partial G^{(26)} / \partial x_1 = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_1' = g_1'(a_1, y_2, y_3); \]

\[ \partial G^{(26)} / \partial x_2 = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g_2(y_1, 0, y_3); \]

\[ \partial G^{(26)} / \partial x_3 = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.26 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

**Problem (P3C) 10.27**

\[ G^{(27)} = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad U = s_1(0, y_2, y_3); \]

\[ \partial G^{(27)} / \partial x_1 = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_1' = g_1'(a_1, y_2, y_3); \]

\[ \partial G^{(27)} / \partial x_2 = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \quad \partial U / \partial n_2 = g_2(y_1, 0, y_3); \]

\[ \partial G^{(27)} / \partial x_3 = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \quad U = s_3(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.27 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremt V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.28

\[ G^{(28)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \partial G^{(28)}/\partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1'(a_1, y_2, y_3); \]
\[ \partial G^{(28)}/\partial x_2 = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ \partial G^{(28)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ G^{(28)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.28 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.29

\[ \partial G^{(29)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(29)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(29)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(29)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ G^{(29)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ G^{(29)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.29 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.30

\[ \partial G^{(30)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(30)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(30)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(30)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ G^{(30)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \]
\[ \partial G^{(30)}/\partial x_3 = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.30 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.31
\[ \frac{\partial G^{(31)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_1} = g_1(0, y_2, y_3); \]
\[ G^{(31)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(31)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(31)} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \]
\[ G^{(31)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_2(y_1, y_2, 0); \]
\[ \frac{\partial G^{(31)}}{\partial x_3} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \frac{\partial U}{\partial n_3'} = g_3'(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.31 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.32
\[ \frac{\partial G^{(32)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_1} = g_1(0, y_2, y_3); \]
\[ G^{(32)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(32)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ G^{(32)} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \]
\[ G^{(32)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_2(y_1, y_2, 0); \]
\[ G^{(32)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_2(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.32 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.33
\[ G^{(33)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ G^{(33)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(33)}}{\partial x_2} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \frac{\partial U}{\partial n_2} = g_2(y_1, 0, y_3); \]
\[ G^{(33)} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \]
\[ G^{(33)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ G^{(33)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.33 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK & USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.34

\[ G^{(34)}(x) = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(y_1, y_2, y_3) \]

\[ G^{(34)}(x) = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, y_2, y_3) \]

\[ \partial G^{(34)}/\partial x_2 = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, y_2, y_3) \]

\[ G^{(34)}(x) = 0; \quad x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_3(y_1, a_2, y_3) \]

\[ \partial G^{(34)}/\partial x_3 = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, y_3) \]

The Answer to Problem (P3C) 10.34 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.35

\[ G^{(35)}(x) = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(y_1, y_2, y_3) \]

\[ G^{(35)}(x) = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, y_2, y_3) \]

\[ \partial G^{(35)}/\partial x_2 = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, y_2, y_3) \]

\[ G^{(35)}(x) = 0; \quad x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_3(y_1, a_2, y_3) \]

\[ G^{(35)}(x) = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, y_3) \]

The Answer to Problem (P3C) 10.35 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.36

\[ G^{(36)}(x) = 0; \quad x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(y_1, y_2, y_3) \]

\[ G^{(36)}(x) = 0; \quad x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, y_2, y_3) \]

\[ \partial G^{(36)}/\partial x_2 = 0; \quad x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, y_2, y_3) \]

\[ G^{(36)}(x) = 0; \quad x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_3(y_1, a_2, y_3) \]

\[ \partial G^{(36)}/\partial x_3 = 0; \quad x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, y_3) \]

\[ G^{(36)}(x) = 0; \quad x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3) \]

The Answer to Problem (P3C) 10.36 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.37

\[G^{(37)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3)\]
\[G^{(37)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3)\]
\[G^{(37)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3)\]
\[\partial G^{(37)}/\partial x_2 = 0; x_1 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2(y_1, a_2, y_3)\]
\[G^{(37)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0)\]
\[G^{(37)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3)\]

The Answer to Problem (P3C) 10.37 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.38

\[G^{(38)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3)\]
\[G^{(38)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3)\]
\[G^{(38)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3)\]
\[\partial G^{(38)}/\partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2(y_1, a_2, y_3)\]
\[\partial G^{(38)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3(y_1, y_2, 0)\]
\[\partial G^{(38)}/\partial x_3 = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3(y_1, y_2, a_3)\]

The Answer to Problem (P3C) 10.38 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.39

\[G^{(39)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3)\]
\[G^{(39)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3)\]
\[G^{(39)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3)\]
\[\partial G^{(39)}/\partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2' = g_2(y_1, a_2, y_3)\]
\[\partial G^{(39)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0)\]
\[\partial G^{(39)}/\partial x_3 = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3' = g_3(y_1, y_2, a_3)\]

The Answer to Problem (P3C) 10.39 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
### Problem (P3C) 10.40

$$G^{(40)} = 0; \ x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1 (0, y_2, y_3);$$

$$G^{(40)} = 0; \ x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2 (y_1, 0, y_3);$$

$$G^{(40)} = 0; \ x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2 (y_1, 0, y_3);$$

$$\partial G^{(40)}/\partial x_2 = 0; \ x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n'_2 = g_2 (y_1, a_2, y_3);$$

$$\partial G^{(40)}/\partial x_3 = 0; \ x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3 (y_1, y_2, 0);$$

$$G^{(40)} = 0; \ x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3 (y_1, y_2, a_3).$$

### The Answer to Problem (P3C) 10.40 for bounded parallelepiped

(Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

### Problem (P3C) 10.41

$$\partial G^{(41)}/\partial x_1 = 0; \ x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1 (0, y_2, y_3);$$

$$\partial G^{(41)}/\partial x_1 = 0; \ x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n'_1 = g'_1 (a_1, y_2, y_3);$$

$$G^{(41)} = 0; \ x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2 (y_1, 0, y_3);$$

$$\partial G^{(41)}/\partial x_2 = 0; \ x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n'_2 = g_2 (y_1, a_2, y_3);$$

$$G^{(41)} = 0; \ x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3 (y_1, y_2, 0);$$

$$G^{(41)} = 0; \ x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3 (y_1, y_2, a_3).$$

### The Answer to Problem (P3C) 10.41 for bounded parallelepiped

(Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

### Problem (P3C) 10.42

$$\partial G^{(42)}/\partial x_1 = 0; \ x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1 (0, y_2, y_3);$$

$$\partial G^{(42)}/\partial x_1 = 0; \ x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n'_1 = g'_1 (a_1, y_2, y_3);$$

$$G^{(42)} = 0; \ x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2 (y_1, 0, y_3);$$

$$\partial G^{(42)}/\partial x_2 = 0; \ x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n'_2 = g_2 (y_1, a_2, y_3);$$

$$\partial G^{(42)}/\partial x_3 = 0; \ x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3 (y_1, y_2, 0);$$

$$G^{(42)} = 0; \ x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3 (y_1, y_2, 0);$$

$$\partial G^{(42)}/\partial x_3 = 0; \ x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n'_3 = g'_3 (y_1, y_2, a_3);$$

### The Answer to Problem (P3C) 10.42 for bounded parallelepiped

(Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.43

\[ \frac{\partial G^{(43)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3), \]
\[ \frac{\partial G^{(43)}}{\partial x_2} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1' = g_1'(a_1, y_2, y_3), \]
\[ G^{(43)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3), \]
\[ \frac{\partial G^{(43)}}{\partial x_3} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3), \]
\[ G^{(43)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0), \]
\[ \frac{\partial G^{(43)}}{\partial x_3} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.43 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.44

\[ \frac{\partial G^{(44)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3), \]
\[ G^{(44)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3), \]
\[ \frac{\partial G^{(44)}}{\partial x_2} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3), \]
\[ G^{(44)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0), \]
\[ \frac{\partial G^{(44)}}{\partial x_3} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.44 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.45

\[ G^{(45)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3), \]
\[ \frac{\partial G^{(45)}}{\partial x_1} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1'(a_1, y_2, y_3), \]
\[ G^{(45)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3), \]
\[ \frac{\partial G^{(45)}}{\partial x_2} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3), \]
\[ G^{(45)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0), \]
\[ G^{(45)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.45 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.46

\[ G^{(46)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(x, y_2, y_3); \]
\[ \partial G^{(46)} / \partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U / \partial u_1' = g_1'(a_1, y_2, y_3); \]
\[ G^{(46)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(x, y_1, y_3); \]
\[ \partial G^{(46)} / \partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U / \partial u_2' = g_2'(y_1, a_2, y_3); \]
\[ \partial G^{(46)} / \partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U / \partial u_3' = g_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.46 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.47

\[ G^{(47)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(x, y_2, y_3); \]
\[ \partial G^{(47)} / \partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U / \partial u_1' = g_1'(a_1, y_2, y_3); \]
\[ G^{(47)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(x, y_1, y_3); \]
\[ \partial G^{(47)} / \partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U / \partial u_2' = g_2'(y_1, a_2, y_3); \]
\[ G^{(47)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U / \partial u_3' = g_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.47 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.48

\[ G^{(48)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(x, y_2, y_3); \]
\[ \partial G^{(48)} / \partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U / \partial u_1' = g_1'(a_1, y_2, y_3); \]
\[ G^{(48)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(x, y_1, y_3); \]
\[ \partial G^{(48)} / \partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U / \partial u_2' = g_2'(y_1, a_2, y_3); \]
\[ \partial G^{(48)} / \partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U / \partial u_3' = g_3'(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.48 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.49

\[ \frac{\partial G^{(49)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U / \partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(49)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(49)}}{\partial x_2} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U / \partial n_3 = g'_2(y_1, a_2, y_3); \]
\[ G^{(49)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s'_3(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.49 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.50

\[ \frac{\partial G^{(50)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U / \partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(50)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(50)}}{\partial x_2} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g'_2(y_1, a_2, y_3); \]
\[ \frac{\partial G^{(50)}}{\partial x_3} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g_3(y_1, y_2, 0); \]
\[ G^{(50)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U / \partial n'_3 = g'_{3}(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.50 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.51

\[ \frac{\partial G^{(51)}}{\partial x_1} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U / \partial n_1 = g_1(0, y_2, y_3); \]
\[ G^{(51)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \]
\[ \frac{\partial G^{(51)}}{\partial x_2} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g'_2(y_1, a_2, y_3); \]
\[ G^{(51)} = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g_3(y_1, y_2, 0); \]
\[ G^{(51)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U / \partial n'_3 = g'_{3}(y_1, y_2, a_3). \]

The Answer to Problem (P3C) 10.51 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.52
\[
\partial G^{(52)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]
\[
G^{(52)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]
\[
G^{(52)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3);
\]
\[
\partial G^{(52)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3);
\]
\[
\partial G^{(52)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
G^{(52)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.52 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.53
\[
\partial G^{(53)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]
\[
\partial G^{(53)}/\partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(y_1, 0, y_3);
\]
\[
\partial G^{(53)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, a_2, y_3);
\]
\[
\partial G^{(53)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
G^{(53)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.53 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.54
\[
\partial G^{(54)}/\partial x_1 = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3);
\]
\[
\partial G^{(54)}/\partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(y_1, a_2, y_3);
\]
\[
\partial G^{(54)}/\partial x_2 = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3);
\]
\[
\partial G^{(54)}/\partial x_3 = 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0);
\]
\[
G^{(54)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3);
\]

The Answer to Problem (P3C) 10.54 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
The Answer to Problem (P3C) 10.55 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

The Answer to Problem (P3C) 10.56 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

The Answer to Problem (P3C) 10.57 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.58

\[ G^{(58)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \partial G^{(58)}/\partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1'(a_1, y_2, y_3); \]
\[ \partial G^{(58)}/\partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ G^{(58)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ \partial G^{(58)}/\partial x_3 = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3'(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.58 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.59

\[ G^{(59)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \partial G^{(59)}/\partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1'(a_1, y_2, y_3); \]
\[ \partial G^{(59)}/\partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ G^{(59)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ G^{(59)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, 0); \]
\[ \partial G^{(59)}/\partial x_3 = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3'(y_1, y_2, 0); \]

The Answer to Problem (P3C) 10.59 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.60

\[ G^{(60)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_1(0, y_2, y_3); \]
\[ \partial G^{(60)}/\partial x_1 = 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1'(a_1, y_2, y_3); \]
\[ \partial G^{(60)}/\partial x_2 = 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \]
\[ G^{(60)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2'(y_1, a_2, y_3); \]
\[ \partial G^{(60)}/\partial x_3 = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3'(y_1, y_2, 0); \]
\[ G^{(60)} = 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3); \]

The Answer to Problem (P3C) 10.60 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.61

\[
\begin{align*}
\partial G^{(61)}/\partial x_1 &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
G^{(61)} &= 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \\
\partial G^{(61)}/\partial x_2 &= 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \\
G^{(61)} &= 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \\
\partial G^{(61)}/\partial x_3 &= 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \\
G^{(61)} &= 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3);
\end{align*}
\]

The Answer to Problem (P3C) 10.61 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.62

\[
\begin{align*}
\partial G^{(62)}/\partial x_1 &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
G^{(62)} &= 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \\
\partial G^{(62)}/\partial x_2 &= 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \\
G^{(62)} &= 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \\
\partial G^{(62)}/\partial x_3 &= 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \\
G^{(62)} &= 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3);
\end{align*}
\]

The Answer to Problem (P3C) 10.62 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)

Problem (P3C) 10.63

\[
\begin{align*}
\partial G^{(63)}/\partial x_1 &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U/\partial n_1 = g_1(0, y_2, y_3); \\
G^{(63)} &= 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2(y_1, 0, y_3); \\
\partial G^{(63)}/\partial x_2 &= 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U/\partial n_2 = g_2(y_1, 0, y_3); \\
G^{(63)} &= 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2(y_1, a_2, y_3); \\
\partial G^{(63)}/\partial x_3 &= 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U/\partial n_3 = g_3(y_1, y_2, 0); \\
G^{(63)} &= 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3(y_1, y_2, a_3);
\end{align*}
\]

The Answer to Problem (P3C) 10.63 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)
Problem (P3C) 10.64

\[
\begin{align*}
\partial G^{(64)} / \partial x_1 &= 0; x_1 = 0, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; \partial U / \partial n_1 = g_1 (0, y_2, y_3); \\
G^{(64)} &= 0; x_1 = a_1, 0 \leq x_2 \leq a_2, 0 \leq x_3 \leq a_3; U = s_2 (y_1, 0, y_3); \\
\partial G^{(64)} / \partial x_2 &= 0; x_2 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; \partial U / \partial n_2 = g_2 (y_1, 0, y_3); \\
G^{(64)} &= 0; x_2 = a_2, 0 \leq x_1 \leq a_1, 0 \leq x_3 \leq a_3; U = s_2' (y_1, a_2, y_3); \\
\partial G^{(64)} / \partial x_3 &= 0; x_3 = 0, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; \partial U / \partial n_3 = g_3 (y_1, y_2, 0); \\
G^{(64)} &= 0; x_3 = a_3, 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2; U = s_3' (y_1, y_2, a_3).
\end{align*}
\]

The Answer to Problem (P3C) 10.64 for bounded parallelepiped (Green’s function for Poisson’s equation in Cartesian coordinates) can be found in the book: Seremet V.D. Handbook of Green’s functions and matrices - WIT press, Southampton and Boston, UK&USA, 2003, Book 304 p. + CD ROM, 232 p. (in English)