List of Boundary-value Problem (P2C) for 2D Cartesian Domains, for which the Green’s Functions for Poisson’s Equation have been derived

All these Green’s functions can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

(P2C) 1. Plane \((-\infty \leq x_1, x_2 \leq \infty\))

In this section formulates boundary-value Problem (P2C)s on constructing Green’s functions \(G\) of Poisson equation for the plane

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

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

The Answer to the Problem (P2C) 1.1 for plane can be found in the following books:
(P2C) 2. Half-plane \((0 \leq x_1 \leq \infty, -\infty \leq x_2 \leq \infty)\)

![Half-plane with the boundary straight line \(\Gamma_{10}\).

Figure 2: Half-plane with the boundary straight line \(\Gamma_{10}\).

(P2C) Boundary-value Problems

Let us consider the following boundary value Problem (P2C)s which consist 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 half-plane. On its boundaries are given the following boundary conditions:

**Problem (P2C) 2.1**

\[
G^{(1)}(x, \xi) = 0; \ x_1 = 0; -\infty \leq x_2 \leq \infty; U(0, y_2) = s(0, y_2)
\]

The Answer to Problem (P2C) 2.1 for half-plane (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 2.2

\[ \frac{\partial}{\partial x_1} G^{(2)} = 0; \ x_1 = 0; \ -\infty \leq x_2 \leq \infty; \]
\[ \partial U(0, y_2) / \partial n_1 = g(0, y_2) \]

The Answer to Problem (P2C) 2.2 for half-plane (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

(P2C) 3. Quadrant \((0 \leq x_1, x_2 \leq \infty)\)

In this section formulates four boundary-value Problems (P2C) on constructing Green’s functions, \(G^{(j)}, j=1-4\), of Poisson’s equation for the quadrant.

![Figure 3: Quadrant with boundary half-straight lines \(\Gamma_{10}\) and \(\Gamma_{20}\).](image)

(P2C) 3.1. Boundary-value Problems and integral representation via Green’s functions

Let us consider the following boundary value Problem (P2C)s which consist from the Poisson equation

\[ \nabla^2 U(x_1, x_2) = -f(x_1, x_2) \tag{3.1} \]

in the inner points of the quadrant. On the boundaries are given two of the following four functions:
The solutions of these boundary value Problem (P2C)s are expressed via respective Green functions in the form of following integral formula:

\[
U(x_1, x_2) = \int_0^\infty \int_0^\infty f(\xi_1, \xi_2) G(x_1, \xi_1; x_2, \xi_2) d\xi_1 d\xi_2 + \\
\int_0^\infty \left[ \frac{\partial U(0, \xi_2)}{\partial n_1} G(0, x_1; \xi_2) - U(0, \xi_2) \frac{\partial G(0, x_1; \xi_2, x_2)}{\partial n_1} \right] dy_2 + \\
\int_0^\infty \left[ \frac{\partial U(y_1, 0)}{\partial n_2} G(y_1, x_1; 0, x_2) - U(y_1, 0) \frac{\partial G(y_1, x_1; 0, x_2)}{\partial n_2} \right] dy_1.
\] (3.3)

In eq. (3.3) Green functions \( G \) and functions \( U \) satisfy Poisson equations

\[
\nabla^2 G(x_1, \xi_1; x_2, \xi_2) = -\delta(x - \xi);
\nabla^2 U(x_1, x_2) = -f(x_1, x_2)
\] (3.4)

and the following boundary conditions:

**Problems (P2C) 3.1- (P2C) 3.4**

And construct the Green’s function \( G^{(j)}(x, \xi), j=1-4 \) for Poisson’s equation

\[
\nabla^2 G(x, \xi) = -\delta(x - \xi)
\] for the quadrant \( 0 \leq x_1 \leq \infty, 0 \leq x_2 \leq \infty \) under the following homogeneous boundary conditions

**Problem (P2C) 3.1**

<table>
<thead>
<tr>
<th>Problem (P2C) 3.1</th>
<th>( G(1) = 0; x_1 = 0, 0 \leq x_2 \leq \infty; U(0, y_2) = s_1(0, y_2); )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( G(2) = 0; x_2 = 0, 0 \leq x_1 \leq \infty; U(y_1, 0) = s_2(y_1, 0). )</td>
</tr>
</tbody>
</table>

The Answer to Problem (P2C) 3.1 for quadrant (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

\[ \frac{\partial G^{(2)}}{\partial x_1} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq \infty; \quad \partial U(0, y_2)/\partial n_1 = g_1(0, y_2); \]

**Problem (P2C) 3.2**

\[ \frac{\partial G^{(2)}}{\partial x_2} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, 0)/\partial n_2 = g_2(y_1, 0). \]

The Answer to Problem (P2C) 3.2 for quadrant (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

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

**Problem (P2C) 3.3**

\[ \frac{\partial G^{(3)}}{\partial x_2} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, 0)/\partial n_2 = g_2(y_1, 0). \]

The Answer to Problem (P2C) 3.3 for quadrant (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 3.4

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

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

The Answer to Problem (P2C) 3.4 for quadrant (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

(P2C) 4. Strip \((-\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2)\)

In this Section for boundary-value Problem (P2C)s on constructing Green’s function \(G^{(j)}, (j = 1 – 4)\) of Poisson’s equation for a strip are formulated

![Figure 4: Strip with boundary straight lines \(\Gamma_{20}\) and \(\Gamma_{21}\).](image)

(P2C) 4.1. Boundary-value Problems and integral representation via Green’s functions

Let us consider the following boundary value Problem (P2C)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 quadrant. On the boundaries are given two of the following four functions:

\[
\frac{\partial U(y_1,0)}{\partial n_2} = g_1(y_1,0) \text{ or } U(y_1,0) = s_1(y_1,0),
\]
\[
\frac{\partial U(y_1,a_2)}{\partial n_2} = g_2(y_1,a_2) \text{ or } U(y_1,a_2) = s_2(y_1,a_2).
\] (4.2)

The solutions of these boundary value Problem (P2C)s are expressed via respective Green functions in the form of following integral formula:

\[
U(x_1,x_2) = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} f(\xi_1,\xi_2) G(x_1,\xi_1; x_2,\xi_2) d\xi_1 d\xi_2 + \\
\int_{-\infty}^{\infty} \left[ \frac{\partial U(y_1,0)}{\partial n_2} G(y_1,x_1;0,x_2) - U(y_1,0) \frac{\partial G(y_1,x_1;0,x_2)}{\partial n_2} \right] dy_1 + \\
\int_{-\infty}^{\infty} \left[ \frac{\partial U(y_1,a_2)}{\partial n_2} G(y_1,x_1;a_2,x_2) - U(0,y_2) \frac{\partial G(y_1,x_1;a_2,x_2)}{\partial n_2} \right] dy_1
\]

In eq. (4.3) Green functions \( G \) and functions \( U \) satisfy Poisson equations

\[
\nabla^2 G(x_1,\xi_1; x_2,\xi_2) = -\delta(x-\xi),
\]
\[
\nabla^2 U(x_1,x_2) = -f(x_1,x_2)
\] (4.4)

and the following boundary conditions:

**Problems (P2C) 4.1-(P2C) 4.4 with the answers**

To construct the Green’s function \( G(x,\xi) \) for Poisson’s equation \( \nabla^2 G(x,\xi) = -\delta(x-\xi) \) for the strip \( -\infty \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2 \) under the following conditions

**Problem (P2C) 4.1**

\[
G^{(l)} = 0; x_2 = 0, -\infty \leq x_1 \leq \infty; U(y_1,0) = s_1(y_1,0),
\]
\[
G^{(l)} = 0; x_2 = a_2 - \infty \leq x_1 \leq \infty; U(y_1,a_2) = s_2(y_1,a_2).
\]

The Answer to Problem (P2C) 4.1 for strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

\[
\frac{\partial G^{(2)}}{\partial x_2} = 0; x_2 = 0, -\infty \leq x_1 \leq \infty; \frac{\partial U(y_1,0)}{\partial n_2} = g_1(y_1,0)
\]

Problem (P2C) 4.2

\[
\frac{\partial G^{(2)}}{\partial x_2} = 0; x_2 = a_2, -\infty \leq x_1 \leq \infty; \frac{\partial U(y_1,a_2)}{\partial n_2} = g_2(y_1,a_2)
\]

The Answer to Problem (P2C) 4.2 for strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

\[
\frac{\partial G^{(3)}}{\partial x_2} = 0; x_2 = 0, -\infty \leq x_1 \leq \infty; \frac{\partial U(y_1,0)}{\partial n_2} = g_1(y_1,0)
\]

Problem (P2C) 4.3

\[
G^{(3)} = 0; x_2 = a_2, -\infty \leq x_1 \leq \infty; U(y_1,a_2) = s_2(y_1,a_2)
\]

The Answer to Problem (P2C) 4.3 for strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 4.4

\[ G^{(4)} = 0; x_2 = 0, -\infty \leq x_1 \leq \infty; U(y_1, 0) = s_1(y_1, 0); \]
\[ \frac{\partial G^{(4)}}{\partial x_2} = 0; x_2 = a_2, -\infty \leq x_1 \leq \infty; \frac{\partial U(y_1, a_2)}{\partial n_2} = g_2(y_1, a_2). \]

The Answer to Problem (P2C) 4.4 for strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

(P2C) 5. Half-strip \((0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2)\)

In this Section formulate eight boundary-value Problem (P2C)s on constructing Green’s functions, \(G^{(j)}, (j = 1–8)\), of Poisson’s equation for the half-strip

![Figure 5: Half-strip with boundary half-straight lines \(\Gamma_{20}\) and \(\Gamma_{21}\) a segment of straight line \(\Gamma_{10}\).](image)

(P2C) 5.1. Boundary-value Problems and integral representation via Green’s functions

Let us consider the following boundary value Problem (P2C)s which consist from the Poisson equation
\[ \nabla^2 U(x_1, x_2) = -f(x_1, x_2) \] (5.1)

in the inner points of the quadrant. On the boundaries are given three of the following six functions:

\[
\begin{align*}
\partial U(0, y_2)/\partial n_1 &= g_1(0, y_2) \quad \text{or} \quad U(0, y_2) = s_1(0, y_2); \\
\partial U(y_1, 0)/\partial n_2 &= g_2(y_1, 0) \quad \text{or} \quad U(y_1, 0) = s_2(y_1, 0); \\
\partial U(y_1, a_2)/\partial n_2 &= g_3(y_1, a_2) \quad \text{or} \quad U(y_1, a_2) = s_3(y_1, a_2).
\end{align*}
\] (5.2)

The solutions of these boundary value Problem (P2C)s are expressed via respective Green functions in the form of following integral formula:

\[
U(x_1, x_2) = \int_{0}^{a_2} \int_{0}^{a_2} f(\zeta_1, \zeta_2) G(x_1, \zeta_1; x_2, \zeta_2) \, d\zeta_1 \, d\zeta_2 + \\
\int_{0}^{a_2} \frac{\partial U(0, y_2) G(0, x_1; y_2, x_2)}{\partial n_1} - U(0, y_2) \frac{\partial G(0, x_1; y_2, x_2)}{\partial n_1} \, dy_2 + \\
\int_{0}^{a_2} \frac{\partial U(y_1, 0) G(y_1, x_1; 0, x_2)}{\partial n_2} - U(y_1, 0) \frac{\partial G(y_1, x_1; 0, x_2)}{\partial n_2} \, dy_1 + \\
\int_{0}^{a_2} \frac{\partial U(y_1, a_2) G(y_1, x_1; a_2, x_2)}{\partial n_2} - U(y_1, a_2) \frac{\partial G(y_1, x_1; a_2, x_2)}{\partial n_2} \, dy_1.
\] (5.3)

In eq. (5.3) Green functions \( G \) and functions \( U \) satisfy Poisson equations

\[
\nabla^2 G(x_1, \zeta_1; x_2, \zeta_2) = -\delta(x - \zeta_1); \\
\nabla^2 U(x_1, x_2) = -f(x_1, x_2)
\] (5.4)

and the boundary conditions in the following Problems:

**Problems (P2C) 5.1- (P2C) 5.8**

To construct the Green’s functions \( G^{(j)}, (j = 1-8) \) for Poisson’s equation

\[ \nabla^2 G(x, \xi) = -\delta(x - \xi) \] for the half-strip \( (0 \leq x_1 \leq \infty, 0 \leq x_2 \leq a_2) \) under the following homogeneous boundary conditions
**Problem (P2C) 5.1**

\[
G^{(1)} = 0, \quad \begin{cases} 
  x_1 = 0; & 0 \leq x_2 \leq a_2; \quad U(0, y_2) = s_1(0, y_2); \\
  x_2 = 0, a_2; & 0 \leq x_1 \leq \infty; \quad U(y_1,0) = s_2(y_1,0); \\
  x_2 = a_2; & 0 \leq x_1 \leq \infty; \quad U(y_1, a_2) = s_3(y_1, a_2).
\end{cases}
\]

The Answer to Problem (P2C) 5.1 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.2**

\[
\frac{\partial G^{(2)}}{\partial x_1} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq a_2; \quad \partial U(0, y_2)/\partial n_1 = g_1(0, y_2); \\
\frac{\partial G^{(2)}}{\partial x_2} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1,0)/\partial n_2 = g_2(y_1,0); \\
\frac{\partial G^{(2)}}{\partial x_2} = 0; \quad x_2 = a_2, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, a_2)/\partial n_2 = g_3(y_1, a_2).
\]

The Answer to Problem (P2C) 5.2 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.3**

\[
G^{(3)} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq a_2; \quad U(0, y_2) = s_1(0, y_2); \\
\frac{\partial G^{(3)}}{\partial x_2} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1,0)/\partial n_2 = g_2(y_1,0); \\
\frac{\partial G^{(3)}}{\partial x_2} = 0; \quad x_2 = a_2, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, a_2)/\partial n_2 = g_3(y_1, a_2).
\]
The Answer to Problem (P2C) 5.3 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.4

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

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

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

The Answer to Problem (P2C) 5.4 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.5

\[ \frac{\partial G^{(5)}}{\partial x_2} = 0; \quad x_2 = a_2, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, a_2) / \partial n_2 = g_3(y_1, a_2) \]

The Answer to Problem (P2C) 5.5 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.6

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

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

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

The Answer to Problem (P2C) 5.6 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.7

\[ G^{(7)}(y_1, a_2) = \begin{cases} 
 x_1 = 0, & 0 \leq x_2 \leq a_2; \\
 x_2 = a_2, & 0 \leq x_1 \leq \infty; \\
 U(0, y_2) = s_1(0, y_2); & 
\end{cases} 
\]

\[ \frac{\partial G^{(7)}}{\partial x_2} = 0; \quad x_2 = 0, \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, 0)/\partial n_2 = g_2(y_1, 0). \]

The Answer to Problem (P2C) 5.7 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 5.8 for half-strip (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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)

(P2C) 6. Rectangle \(0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2\)

In this section formulates 16 boundary-value Problem (P2C)s on constructing Green’s functions, \(G^{(j)}, (j = 1 − 16)\), of Poisson’s equation for t

\[
\frac{\partial G^{(8)}}{\partial x_1} = 0; \quad x_1 = 0, \quad 0 \leq x_2 \leq a_2; \quad \partial U(0, y_2) / \partial n_1 = g_1(0, y_2);
\]

\[G^{(8)} = 0; \quad x_2 = 0; \quad 0 \leq x_1 \leq \infty; \quad U(y_1, 0) = s_2(y_1, 0);
\]

\[
\frac{\partial G^{(8)}}{\partial x_2} = 0; \quad x_2 = a_2; \quad 0 \leq x_1 \leq \infty; \quad \partial U(y_1, a_2) / \partial n_2 = g_3(y_1, a_2);
\]

Figure 6: Rectangle with boundary segments of straight lines \(\Gamma_{10}, \Gamma_{11}\) and \(\Gamma_{20}, \Gamma_{21}\).

(P2C) 6.1. Boundary-value Problems and integral representation via Green’s functions

Let us consider the following boundary value Problem (P2C)s which consist from the Poisson equation

\[
\nabla^2 U(x_1, x_2) = -f(x_1, x_2)
\] (6.1)
in the inner points of the quadrant. On the boundaries are given four of the following eight functions:

\[ \partial U(0, y_2)/\partial n_1 = g_1(0, y_2) \quad \text{or} \quad U(0, y_2) = s_1(0, y_2); \]
\[ \partial U(a_1, y_2)/\partial n_1 = g_4(a_1, y_2) \quad \text{or} \quad U(a_1, y_2) = s_4(a_1, y_2); \]
\[ \partial U(y_1, 0)/\partial n_2 = g_2(y_1, 0) \quad \text{or} \quad U(y_1, 0) = s_2(y_1, 0); \]
\[ \partial U(y_1, a_2)/\partial n_2 = g_3(y_1, a_2) \quad \text{or} \quad U(y_1, a_2) = s_3(y_1, a_2). \] (6.2)

The solutions of these boundary value Problem (P2C)s are expressed via respective Green functions in the form of following integral formula:

\[
U(x_1, x_2) = \int_0^{a_1} \int_0^{a_2} f(\xi_1, \xi_2)G(x_1, \xi_1; x_2, \xi_2)d\xi_1d\xi_2 + \\
\int_0^{a_2} \left[ \frac{\partial U(0, y_2)}{\partial n_1}G(0, x_1; y_2, x_2) - U(0, y_2)\frac{\partial G(0, x_1; y_2, x_2)}{\partial n_1} \right] dy_2 + \\
\int_0^{a_2} \left[ \frac{\partial U(a_1, y_2)}{\partial n_1}G(a_1, x_1; y_2, x_2) - U(a_1, y_2)\frac{\partial G(a_1, x_1; y_2, x_2)}{\partial n_1} \right] dy_2 + \\
\int_0^{a_1} \left[ \frac{\partial U(y_1, 0)}{\partial n_2}G(y_1, x_1; 0, x_2) - U(y_1, 0)\frac{\partial G(y_1, x_1; 0, x_2)}{\partial n_2} \right] dy_1 + \\
\int_0^{a_1} \left[ \frac{\partial U(y_1, a_2)}{\partial n_2}G(y_1, x_1; a_2, x_2) - U(y_1, a_2)\frac{\partial G(y_1, x_1; a_2, x_2)}{\partial n_2} \right] dy_1.
\] (6.3)

In eq. (6.3) Green functions \( G \) and functions \( U \) satisfy Poisson equations

\[
\nabla^2 G(x_1, \xi_1; x_2, \xi_2) = -\delta(x - \xi);
\]
\[
\nabla^2 U(x_1, x_2) = -f(x_1, x_2)
\] (6.4)

and the following boundary conditions:

**Problems (P2C)6.1- (P2C)6.16**

To construct the Green’s functions \( G^{(j)} \), \( j = 1-16 \) for Poisson’s equation

\( \nabla^2 G(x, \xi) = -\delta(x - \xi) \) for the rectangle \( 0 \leq x_1 \leq a_1, 0 \leq x_2 \leq a_2 \) under the following homogeneous boundary conditions
The Answer to Problem (P2C) 6.1 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.2 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.3

\( G^{(3)} = 0; \ x_1 = 0; \ 0 \leq x_2 \leq a_2; \ U(0, y_2) = s_1(0, y_2); \)
\( G^{(3)} = 0; \ x_1 = a_1; \ 0 \leq x_2 \leq a_2; \ U(a_1, y_2) = s_4(a_1, y_2); \)

\[ \frac{\partial G^{(3)}}{\partial x_2} = 0; \ x_2 = 0; \ 0 \leq x_1 \leq a_1; \ \frac{\partial U(y_1, 0)}{\partial n_2} = g_2(y_1, 0); \]
\[ \frac{\partial G^{(3)}}{\partial x_2} = 0; \ x_2 = a_2; \ 0 \leq x_1 \leq a_1; \ \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2); \]

The Answer to Problem (P2C) 6.3 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.4

\[ \frac{\partial G^{(4)}}{\partial x_1} = 0; \ x_1 = 0; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(0, y_2)}{\partial n_1} = g_1(0, y_2); \]
\[ \frac{\partial G^{(4)}}{\partial x_1} = 0; \ x_1 = a_1; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(a_1, y_2)}{\partial n_1} = g_4(a_1, y_2); \]

\[ G^{(4)} = 0; \ x_2 = 0; \ 0 \leq x_1 \leq a_1; \ U(y_1, 0) = s_2(y_1, 0); \]
\[ G^{(4)} = 0; \ x_2 = a_2; \ 0 \leq x_1 \leq a_1; \ U(y_1, a_2) = s_3(y_1, a_2); \]

The Answer to Problem (P2C) 6.4 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermo-magneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.5**

\[ G^{(5)} = 0; x_1 = 0; 0 \leq x_2 \leq a_2; U(0, y_2) = s_1(0, y_2); \]
\[ \frac{\partial G^{(5)}}{\partial x_1} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2; \frac{\partial U(a_1, y_2)}{\partial n_1} = g_4(a_1, y_2); \]
\[ G^{(5)} = 0; x_2 = 0, 0 \leq x_1 \leq a_1; U(y_1, 0) = s_2(y_1, 0); \]
\[ G^{(5)} = 0; x_2 = a_2, 0 \leq x_1 \leq a_1; U(y_1, a_2) = s_3(y_1, a_2). \]

The Answer to Problem (P2C) 6.5 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.6**

\[ \frac{\partial G^{(6)}}{\partial x_1} = 0; x_1 = 0; 0 \leq x_2 \leq a_2; \frac{\partial U(0, y_2)}{\partial n_1} = g_1(0, y_2); \]
\[ G^{(6)} = 0; x_1 = a_1; 0 \leq x_2 \leq a_2; U(a_1, y_2) = s_4(a_1, y_2); \]
\[ \frac{\partial G^{(6)}}{\partial x_2} = 0; x_2 = 0; 0 \leq x_1 \leq a_1; \frac{\partial U(y_1, 0)}{\partial n_2} = g_2(y_1, 0); \]
\[ \frac{\partial G^{(6)}}{\partial x_2} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1; \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2). \]

The Answer to Problem (P2C) 6.6 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)
\[ G^{(7)} = 0; \ x_1 = 0; \ 0 \leq x_2 \leq a_2; \ U(0, y_2) = s_1(0, y_2); \]
\[ \frac{\partial G^{(7)}}{\partial x_1} = 0; \ x_1 = a_1; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(a_1, y_2)}{\partial n_1} = g_4(a_1, y_2); \]
\[ \frac{\partial G^{(7)}}{\partial x_2} = 0; \ x_2 = 0; \ 0 \leq x_1 \leq a_1; \ \frac{\partial U(y_1, 0)}{\partial n_2} = g_2(y_1, 0); \]
\[ \frac{\partial G^{(7)}}{\partial x_2} = 0; \ x_2 = a_2; \ 0 \leq x_1 \leq a_1; \ \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2). \]

**Problem (P2C) 6.7**

The Answer to Problem (P2C) 6.7 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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)

\[ \frac{\partial G^{(8)}}{\partial x_1} = 0; \ x_1 = 0; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(0, y_2)}{\partial n_1} = g_1(0, y_2); \]
\[ G^{(8)} = 0; \ x_1 = a_1, 0 \leq x_2 \leq a_2; U(a_1, y_2) = s_4(a_1, y_2); \]
\[ G^{(8)} = 0; \ x_2 = 0; \ 0 \leq x_1 \leq a_1; U(y_1, 0) = s_2(y_1, 0); \]
\[ G^{(8)} = 0; \ x_2 = a_2; \ 0 \leq x_1 \leq a_1; U(y_1, a_2) = s_3(y_1, a_2). \]

**Problem (P2C) 6.8**

The Answer to Problem (P2C) 6.8 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.9

\[ G^{(9)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2; U(0, y_2) = s_1(0, y_2); \]
\[ G^{(9)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2; U(a_1, y_2) = s_4(a_1, y_2); \]
\[ \frac{\partial G^{(9)}}{\partial x_2} = 0; x_2 = 0; 0 \leq x_1 \leq a_1; \frac{\partial U(y_1, 0)}{\partial n_2} = g_2(y_1, 0); \]
\[ G^{(9)} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1; U(y_1, a_2) = s_3(y_1, a_2). \]

The Answer to Problem (P2C) 6.9 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:
1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.10

\[ G^{(10)} = 0; x_1 = 0, 0 \leq x_2 \leq a_2; U(0, y_2) = s_1(0, y_2); \]
\[ G^{(10)} = 0; x_1 = a_1, 0 \leq x_2 \leq a_2; U(a_1, y_2) = s_4(a_1, y_2); \]
\[ G^{(10)} = 0; x_2 = 0; 0 \leq x_1 \leq a_1; U(y_1, 0) = s_2(y_1, 0); \]
\[ \frac{\partial G^{(10)}}{\partial x_2} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1; \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2). \]

The Answer to Problem (P2C) 6.10 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:
1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).
2. 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 (P2C) 6.11

$$\frac{\partial G^{(1)}}{\partial x_1} = 0; \ x_1 = 0; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(0, y_2)}{\partial n_1} = g_1(0, y_2);$$

$$\frac{\partial G^{(1)}}{\partial x_1} = 0; \ x_1 = a_1; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(a_1, y_2)}{\partial n_1} = g_4(a_1, y_2);$$

$$G^{(1)} = 0; x_2 = 0; \ 0 \leq x_1 \leq a_1; \ U(y_1, 0) = s_2(y_1, 0);$$

$$\frac{\partial G^{(1)}}{\partial x_2} = 0; x_2 = a_2; \ 0 \leq x_1 \leq a_1; \ \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2).$$

The Answer to Problem (P2C) 6.11 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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 (P2C) 6.12

$$G^{(12)} = 0; x_1 = 0; \ 0 \leq x_2 \leq a_2; \ U(0, y_2) = s_1(0, y_2);$$

$$\frac{\partial G^{(12)}}{\partial x_1} = 0; \ x_1 = a_1; \ 0 \leq x_2 \leq a_2; \ \frac{\partial U(a_1, y_2)}{\partial n_1} = g_4(a_1, y_2);$$

$$G^{(12)} = 0; x_2 = 0; \ 0 \leq x_1 \leq a_1; \ U(y_1, 0) = s_2(y_1, 0);$$

$$\frac{\partial G^{(12)}}{\partial x_2} = 0; x_2 = a_2; \ 0 \leq x_1 \leq a_1; \ \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2).$$

The Answer to Problem (P2C) 6.12 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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 (P2C) 6.13

\[
\frac{\partial G^{(13)}}{\partial x_1} = 0; x_1 = 0; 0 \leq x_2 \leq a_2; \frac{\partial U(0, y_2)}{\partial n_1} = g_1(0, y_2);
\]

\[
G^{(13)}(x_1) = 0; x_1 = a_1; 0 \leq x_2 \leq a_2; U(a_1, y_2) = s_4(a_1, y_2);
\]

\[
G^{(13)}(x_2) = 0; x_2 = 0; 0 \leq x_1 \leq a_1; U(y_1, 0) = s_2(y_1, 0);
\]

\[
\frac{\partial G^{(13)}}{\partial x_2} = 0; x_2 = a_2; 0 \leq x_1 \leq a_1; \frac{\partial U(y_1, a_2)}{\partial n_2} = g_3(y_1, a_2);
\]

The Answer to Problem (P2C) 6.13 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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 (P2C) 6.14

\[
\frac{\partial G^{(14)}}{\partial x_1} = 0; x_1 = 0, a_1; 0 \leq x_2 \leq a_2; \frac{\partial U(0, y_2)}{\partial n_1} = g_1(0, y_2);
\]

\[
\frac{\partial G^{(14)}}{\partial x_1} = 0; x_1 = 0, a_1; 0 \leq x_2 \leq a_2; \frac{\partial U(a_1, y_2)}{\partial n_1} = g_4(a_1, y_2);
\]

\[
\frac{\partial G^{(14)}}{\partial x_2} = 0; x_2 = 0; 0 \leq x_1 \leq a_1; \frac{\partial U(y_1, 0)}{\partial n_2} = g_2(y_1, 0);
\]

\[
G^{(14)}(x_2) = 0; x_2 = a_2; 0 \leq x_1 \leq a_1; U(y_1, a_2) = s_3(y_1, a_2).
\]

The Answer to Problem (P2C) 6.14 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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 (P2C) 6.15 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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 (P2C) 6.16

The Answer to Problem (P2C) 6.16 for rectangle (Green’s function for Poisson’s equation) can be found in the following books:

1. Victor Seremet & Guy Bonnet, Encyclopedia of Domain Green’s Functions (Thermomagneto-electrostatics of solids in rectangular and polar coordinates), State Agrarian University of Moldova: Publisher Center of UASM, Chisinau, Moldova, 2008, 220 pag., (in English).

2. 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)