Q1
(a) Write the inequality in standard form:
\[ y \leq -x + 3 \]
So, solution of the inequality is the area below the line
\[ y = -x + 3 \]
(The sign is \( \leq \), so the line is included into the region).

(b) Write the inequality in standard form:
\[ y > \frac{3x}{4} - 6 \]
So, solution of the inequality is the area above the line
\[ y = -\frac{3x}{4} - 6 \]
(The sign is \( > \), so the line is excluded from the region).
(c) Write the inequality in standard form:

\[ y < \frac{5}{2}x - 5 \]

So, solution of the inequality is formed by all the integer nodes of coordinate grid in the area below the line

\[ y = -\frac{3x}{4} - 6 \]

(The sign is <, so the line is excluded from the region).
Q2

(a) Write the inequalities in standard form:

\[
\begin{align*}
    y &\leq -\frac{x}{3} + 2 \\
    y &< \frac{x}{2} - 1
\end{align*}
\]

Solution of the system of inequalities is the region that is simultaneously:
- below the line \( y = -\frac{x}{3} + 2 \) (the line is included into the region)
- below the line \( y = \frac{x}{2} - 1 \) (the line is excluded from the region)

(b) Write the inequalities in standard form:

\[
\begin{align*}
    y &\leq -x + 4 \\
    y &< x + 4 \\
    y &\geq 0
\end{align*}
\]

Solution of the system of inequalities is the region that is simultaneously:
- below the line \( y = -x + 4 \) (the line is included into the region)
- below the line \( y = x + 4 \) (the line is excluded from the region)
- in the top half of the plane (above x-axis, the axis is included to the region)
(c) Write the inequalities in standard form:

\[
\begin{align*}
y & > 2x - 4 \\
x & \geq 0 \\
y & \geq 0
\end{align*}
\]

Solution of the system of inequalities is the region that is simultaneously:
- above the line \( y = 2x - 4 \) (the line is excluded from the region)
- in the first quarter (axes are included to the region)

(d) Write the inequalities in standard form:

\[
\begin{align*}
y & \geq \frac{x}{6} + 1 \\
y & < -\frac{5x}{2} + 5 \\
y & < x + 3
\end{align*}
\]

Solution of the system of inequalities is the region that is simultaneously:
- above the line \( y = \frac{x}{6} + 1 \) (the line is included into the region)
- below the line \( y = -\frac{5x}{2} + 5 \) (the line is excluded from the region)
- below the line $y = x + 3$ (the line is excluded from the region)

(e) Write the inequalities in standard form:

\[
\begin{align*}
  y &< \frac{5x}{4} - 5 \\
  y &\leq -\frac{x}{2} + 2 \\
  x &\leq 0 \\
  y &\leq 0 
\end{align*}
\]

Solution of the system of inequalities is the region that is simultaneously:
- below the line $y = \frac{5x}{4} - 5$ (the line is excluded from the region)
- below the line $y = -\frac{x}{2} + 2$ (the line is included to the region)
- in the third quarter (axes are included to the region)