1. Graph \( y = -|x+5| \), and find the domain and range. Write the answers in the interval notation. Also find the intervals on the x-axis on which the function is increasing or decreasing.

- Domain: \((-\infty, \infty)\)
- Range: \([-\infty, 0]\)
- Function is inc. on \((-\infty, -5]\)
- Function is dec. on \([-5, \infty)\)

2. Graph \( y = \sqrt{x-3} + 4 \), and find the domain and range. Write the answers in the interval notation.

- Domain: \([3, \infty)\)
- Range: \([4, \infty)\)

3. Find the center and the radius of \((x-2)^2 + (y+3)^2 = 25\). Graph it and find the domain and range. Write the answers in the interval notation.

- Center: \((2, -3)\)
- Radius: \(\sqrt{25} = 5\)
- Domain: \([-3, 7]\)
- Range: \([-8, 2]\)

4. Graph \( x = y^2 - 4 \), and find the domain and range. Write the answers in the interval notation.

- \( x = y^2 - 4 \)
- \( y^2 = x + 4 \)
- Take \( \pm \) root of both sides
- \( y = \pm \sqrt{x+4} \)
- Domain: \([-4, \infty)\)
- Range: \((-\infty, \infty)\)
3) Graph \( x = y^2 - 4 \), and find the domain and range. Write the answers in the interval notation.

\[
\begin{align*}
x &= y^2 - 4 \\
y^2 &= x + 4 \\
\text{Take sq. root of both sides} \\
y &= \pm \sqrt{x + 4}
\end{align*}
\]

\[
\text{Domain } = [-4, \infty) \\
\text{Range } = (-\infty, \infty)
\]

5) Use transformation techniques to draw the graph of \( y = -\frac{1}{2} (x+3)^2 - 1 \). Make sure to show all the intermediate graphs, and their equations.

**Note:** You must build "-12" term at the very last step:

- I. \( y = x^2 \)
- II. \( y = (x+3)^2 \)
- III. \( y = \frac{1}{2} (x+3)^2 \)
- IV. \( y = -\frac{1}{2} (x+3)^2 \)
- V. \( y = -\frac{1}{2} (x+3)^2 - 12 \)
6. (a) The graph of \( y = 2x - x^2 \) is moved 2 units to the left, and then reflected on the x-axis. What is the equation of the final graph? Simplify.

First: \( y = 2(x+2) - (x+2)^2 \)

Second: \( y = -\left[2(x+2) - (x+2)^2\right] \)
\[ = -\left[2x + 4 - x^2 - 4x - 4\right] \]
\[ = -(x^2 - 2x) = x^2 + 2x \]

Eqn. of the final graph: \( y = x^2 + 2x \)

(b) The graph of some function \( y = f(x) \) is given below. Draw the graph of \( y = \frac{1}{2}f(x) \) on the same set of axes.

7. Consider the functions \( f(x) = 2 - 3x \) and \( g(x) = -x^2 + 3x + 4 \). Find

(a) \( (f \circ g)(-2) \)
\[ = f(-2) \cdot g(-2) \]
\[ = [2 - 3(-2)] \cdot [-(-2)^2 + 3(-2) + 4] \]
\[ = (8)(-8) = -64 \]
\[ \therefore (f \circ g)(-2) = -64 \]

(b) \( (g \circ f)(x) \) Simplify.
\[ = g(f(x)) \]
\[ = -(2 - 3x)^2 + 3(2 - 3x) + 4 \]
\[ = -(4 - 12x + 9x^2) + 6 - 9x + 4 \]
\[ = -9x^2 + 3x + 6 \]
\[ \therefore (g \circ f)(x) = -9x^2 + 3x + 6 \]

8. Find the equation of the line passing through the points \((-1, -3)\) and \((6, 2)\). Leave your answer in the slope-intercept form. Do this problem by hand and provide the exact answers.

Slope = \( \frac{y_2 - y_1}{x_2 - x_1} \)

Use: \( y - y_1 = m(x - x_1) \)
\[ y + 3 = \frac{5}{7}(x + 1) \]
\[ y + 3 = \frac{5}{7}x + \frac{5}{7} \]
\[ y = \frac{5}{7}x + \left(\frac{5}{7} - 3\right) \]
\[ y = \frac{5}{7}x - \frac{16}{7} \]
9) Find the equation of the line passing through the point \((3, -4)\) and which is perpendicular to the line \(5x - 7y - 3 = 0\). Leave your answer in the standard form with integral coefficients.

\[
\begin{align*}
\text{eqn. of 1st line: } & \quad y - y_1 = m(x - x_1) \\
& \quad y + 4 = -\frac{7}{5}(x - 3) \\
& \quad 5(y + 4) = 7(x - 3) \\
& \quad 5y + 20 = 7x - 21 \\
& \quad 7x + 5y = 1
\end{align*}
\]

\[
\begin{align*}
\text{eqn? } & \quad \text{slope of given line } = \frac{5}{7} \\
\text{slope of 1st line } & \quad = -\frac{1}{m} = -\frac{7}{5}
\end{align*}
\]

10) A company charges \$25 for 230 cards, and \$45 for 600 cards. Given that the cost is a linear function of the number of cards, find that function. Also find the cost for 800 cards.

\[
\begin{align*}
\text{eqn: } & \quad y - 25 = \frac{2}{37}(x - 230) \\
& \quad y = \frac{2}{37}x + \frac{465}{37} \\
& \quad \therefore \text{Cost} = \frac{2}{37}(\text{# cards}) + \frac{465}{37} \\
& \quad \text{Cost for 800 cards} = \frac{2}{37}(800) + \frac{465}{37} \\
& \quad \approx 55.81
\end{align*}
\]