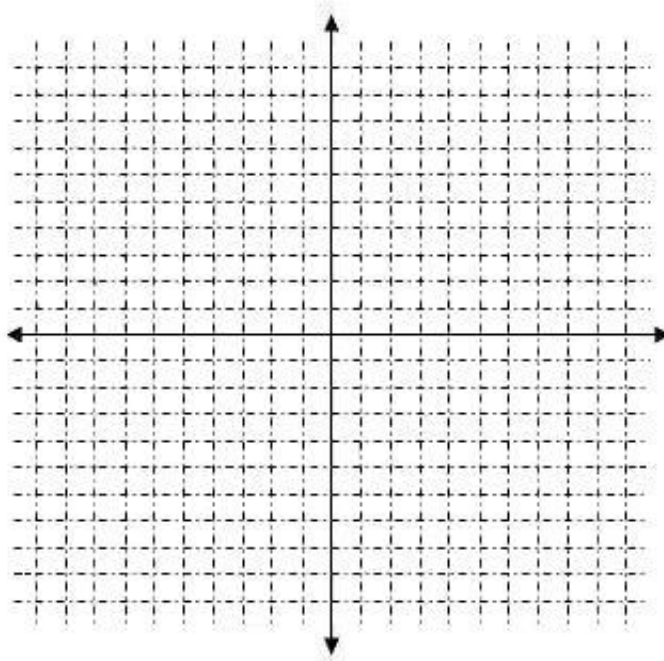


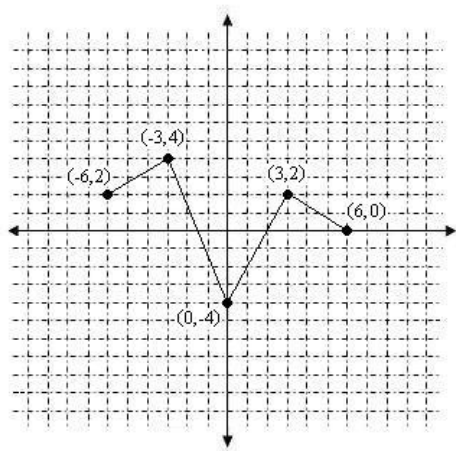
1. Consider the following piecewise function:

$$f(x) = \begin{cases} -x - 2 & \text{if } x < -3 \\ x & \text{if } -3 \leq x < 2 \\ -2x + 10 & \text{if } x \geq 2 \end{cases}$$

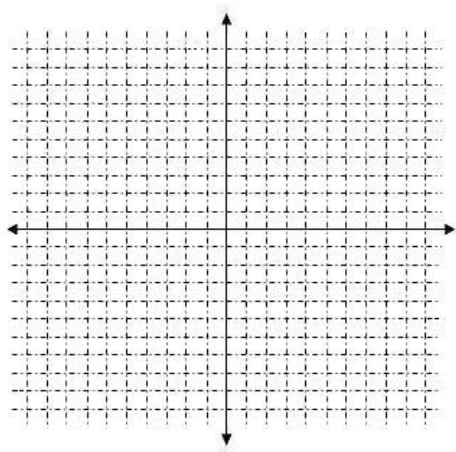
Graph this function on the axis.



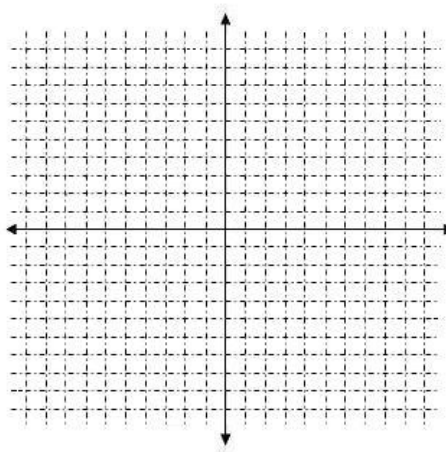
2. The graph on the first grid is that of $y = f(x)$. Use this to help you graph the following.



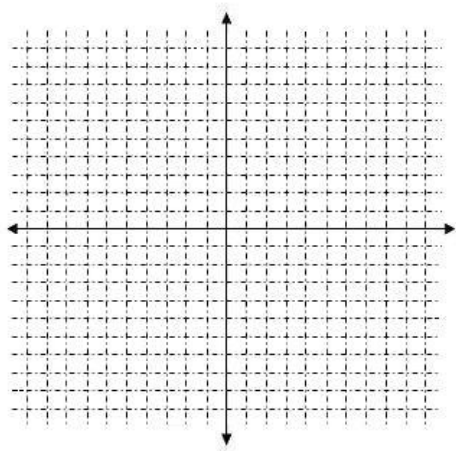
a.) $y = 3 - f(x + 1)$.



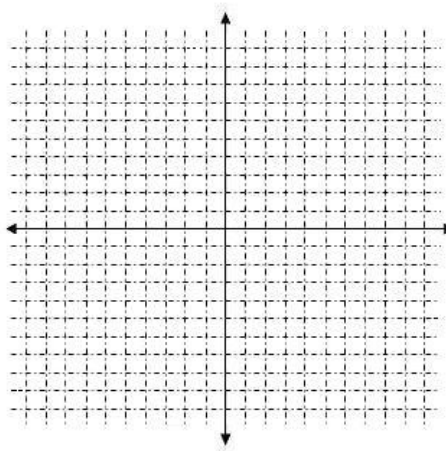
b.) $y = f(-(x - 2)) - 2$.



c.) $y = 2f(x - 3) - 1$.



d.) $y = f(-3x) + 5$.



3. Consider the function $f(x) = 5x^2 - 11x + 6$.

(a) Find the axis of symmetry and vertex of the graph of f .

(b) Find all intercepts of the graph of f .

4. A parabola with vertex $\left(\frac{3}{2}, -\frac{5}{4}\right)$ crosses the y -axis at $y = -\frac{11}{4}$. Find the equation of this parabola.

5. Consider the polynomial function $f(x) = 7x^2(x - 3)^3(x^2 - 4)(x^2 + 5x + 6)(x^2 - 5x + 6)$.

(a) Find all of the zeros, list the multiplicity of each zero, and determine whether the graph of f crosses or touches the x -axis at each zero.

(b) Determine the power function that f resembles for large values of $|x|$.

(c) What is the maximum number of turning points that the graph of f can have?

6. Consider the rational function $R(x) = \frac{-3x^3 + 27x}{5x^3 - 15x^2 - 20x + 60}$.

(a) Find the domain of R .

(b) Find all asymptotes of the graph of f .

7. Solve the following inequalities.

(a) $6(x - 1)(x + 1) \leq 31(x - 1) - 10.$

(b) $\frac{1}{x - 2} \geq \frac{x + 1}{x^2}.$