Algebra 2   **Midyear Review #2**   **Name:** _____
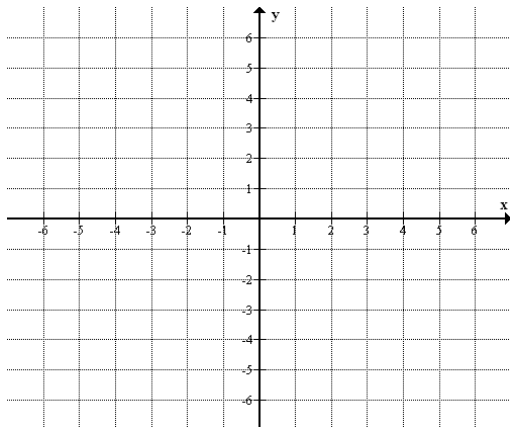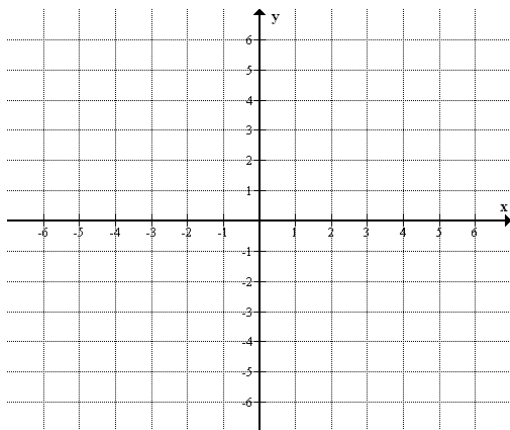
*1.   Graph: $y = \dfrac{2}{5}(x+2) - 4$

*2.   Graph: $y = -3x^2 + 5$ and state the domain and range in interval notation.

domain: _____

range: _____

*3.   Use the quadratic formula to solve for x: $2x^2 - 3x - 9 = 0$

A) $\left\{ 3\dfrac{1}{2}, -3 \right\}$

B) $\left\{ \dfrac{3 + 3\sqrt{3}}{4}, \dfrac{3 - 3\sqrt{3}}{4} \right\}$

C) $\left\{ 3, -1\dfrac{1}{2} \right\}$

D) $\left\{ \dfrac{1}{2}, -3 \right\}$

*4.   Use the quadratic formula to solve for x: $5x^2 - 6x = 7$

A) $\left\{ \dfrac{4+2\sqrt{7}}{3}, \dfrac{4-2\sqrt{7}}{3} \right\}$

B) $\left\{ \dfrac{-3+2\sqrt{11}}{5}, \dfrac{-3-2\sqrt{11}}{5} \right\}$

C) $\left\{ \dfrac{3+2\sqrt{11}}{5}, \dfrac{3-2\sqrt{11}}{5} \right\}$

D) No solution.

*5.   Use the parent function $y = x^2$ and write functions for these transformations:

a) Shift down four units

b) Vertical compression by a factor of .5 and shift right 3

c) Shift left 3 and up 2

d) Flip over x-axis and then shift left 4

e) Flip over x-axis, shift left 2 units and then shift up 7

f) Vertical stretch by a factor of 3 and then shift down 8

*6. Consider the parent function $y = f(x)$. Write one sentence describing each transformation.
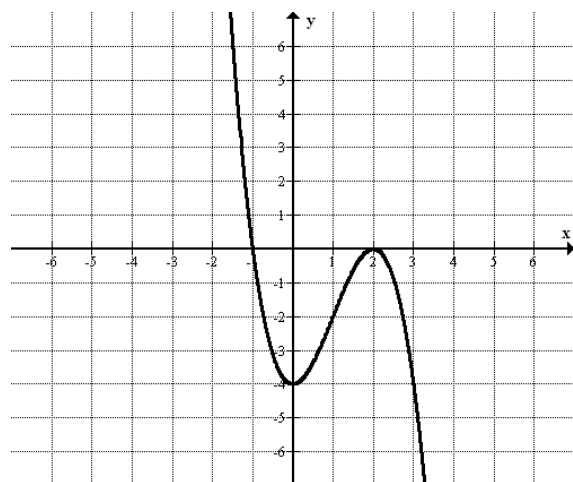
a. $y = \dfrac{1}{2}f(x)$

b. $y = f(x+1) - 2$

c. $y = -f(x)$

d. $y = f(-x)$

e. $y = f(x-1) + 2$

*7.   State all the x-intercepts of the function: $y = 3x(x-1)(x+2)(x^2-25)$

    a. $1, -2, 25$ b. $0, 1, -2$ c. $1, -2, 5, -5$
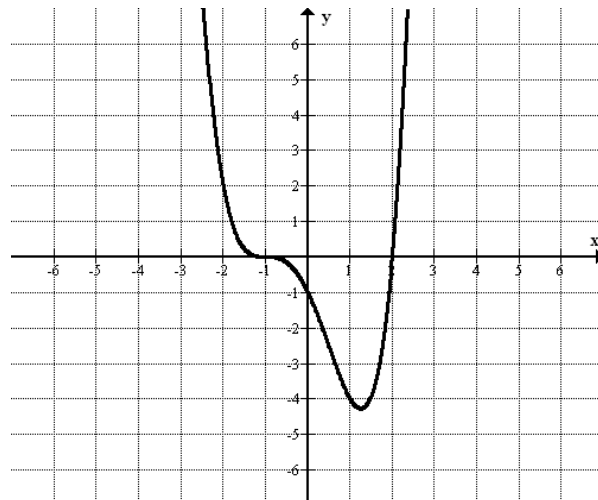
    d. $0, 1, -2, 5, -5$ e. $3, 1, -2, 25$

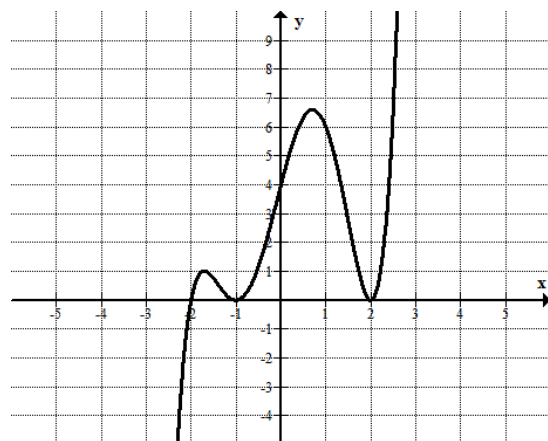*10.   Write an equation for the graph. Leave your answer in intercept form.
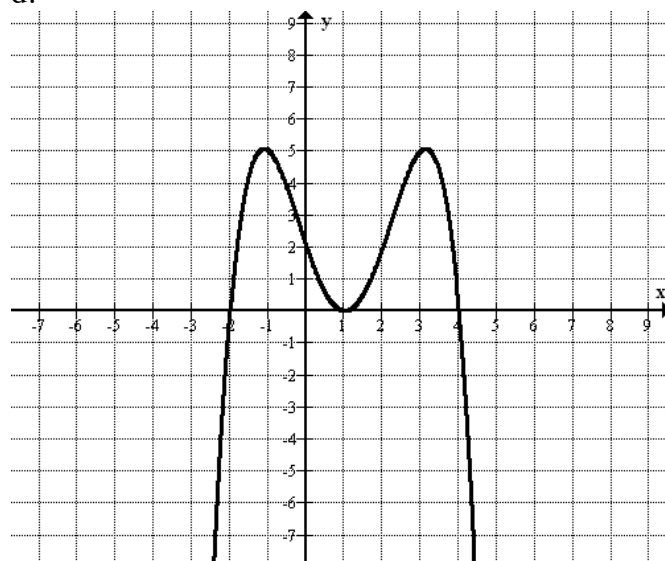
a.   b.

a._____   b._____

c.   d.

c. _____   d. _____

*11. Describe the end behavior of each function.

     a. $f(x) = x^3 - 10x^2 + 33x - 35$

A.   as $x \to +\infty$, f(x) $\to +\infty$ B.   as $x \to +\infty$, f(x) $\to +\infty$

         as $x \to -\infty$, f(x) $\to +\infty$ as $x \to -\infty$, f(x) $\to -\infty$

C.   as $x \to +\infty$, f(x) $\to -\infty$ D.   as $x \to +\infty$, f(x) $\to -\infty$

         as $x \to -\infty$, f(x) $\to +\infty$ as $x \to -\infty$, f(x) $\to -\infty$

     b. $f(x) = -6x^4 - x^3 - 10x^2 + 33x - 35$

A.   as $x \to +\infty$, f(x) $\to +\infty$ B.   as $x \to +\infty$, f(x) $\to +\infty$

         as $x \to -\infty$, f(x) $\to +\infty$ as $x \to -\infty$, f(x) $\to -\infty$

C.   as $x \to +\infty$, f(x) $\to -\infty$ D.   as $x \to +\infty$, f(x) $\to -\infty$

         as $x \to -\infty$, f(x) $\to +\infty$ as $x \to -\infty$, f(x) $\to -\infty$

*12. Describe the leading coefficient as positive or negative. Describe the degree as even or odd.

a.   b.
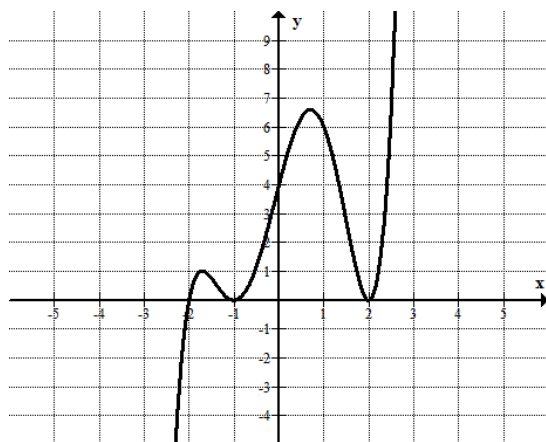
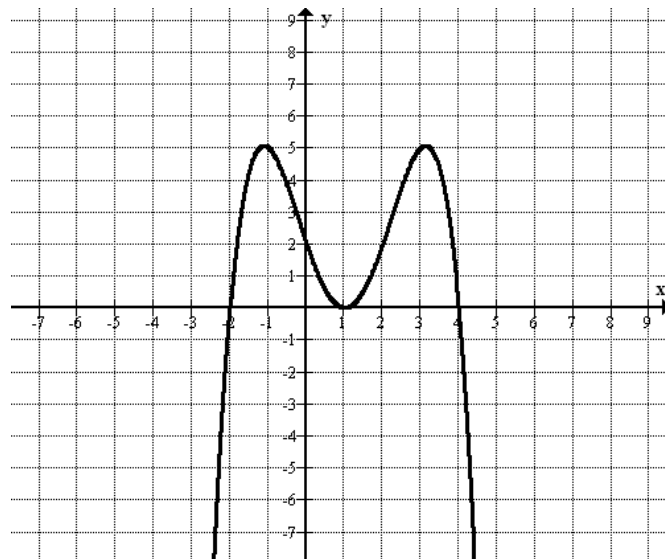even or odd   even or odd

positive or negative leading coefficient   positive or negative leading coefficient

*13. Given the following function, $y = 3x^2 - 6x - 2$, provide the indicated information.
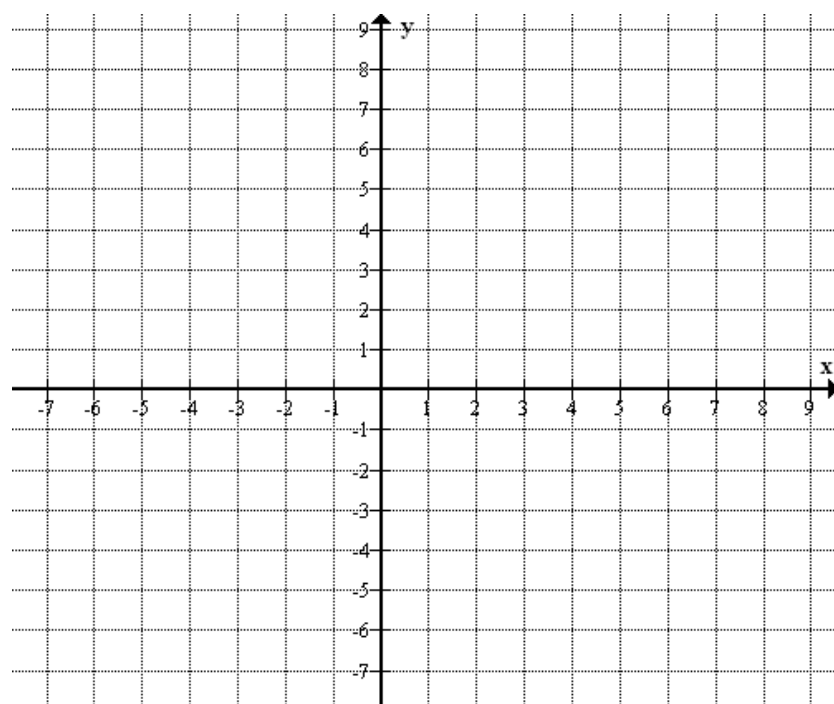
a. vertex: _____

b. coordinate of the y-intercept: _____

c. equation of the axis of symmetry: _____

d. coordinates of the x-intercepts: _____

e. Graph the function.

*14. Given: $y = 2x^2 + 12x + 13$

     a. Find the coordinates of the vertex by completing the square.

     b. Write the function in vertex form.

     c. Find the coordinates of the x-intercepts.

*15. Find the coordinates of the y-intercept for $y = 4(x+2)^2 - 12$.

*16. Write the quadratic equation in vertex form and give the coordinates of the vertex.

$$y = 2x^2 - 4x - 1$$

(A) $y = 2(x-1)^2 - 2$ (B) $y = 2(x-1)^2 + 5$ (C) $y = 2(x-1)^2 - 3$

      vertex: $(1, -2)$ vertex: $(1, 5)$ vertex: $(1, -3)$

(D) $y = 2(x+1)^2 + 3$ (E) $y = 2(x-2)^2 - 9$

   vertex: $(-1, 3)$ vertex: $(2, -9)$

17. A ball is launched from a height of 10 feet. The ball's height is modeled by the function
$h(t) = -16t^2 + 32t + 10$ where h represents the height of the ball in feet and t represents time in seconds.

    a.   What is the height of the ball after 2 seconds?

    b.   What is the maximum height that the ball reaches?

    c.   When does the ball hit the ground?

    d.   When does the ball reach a height of 20 feet?

18. The graph of a function is shown below. Sketch a graph of its inverse on the coordinate plane.
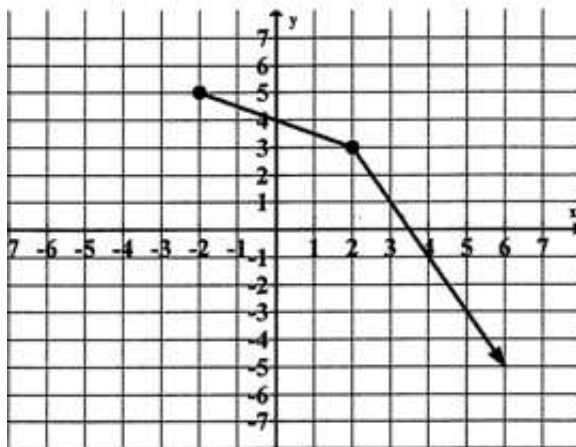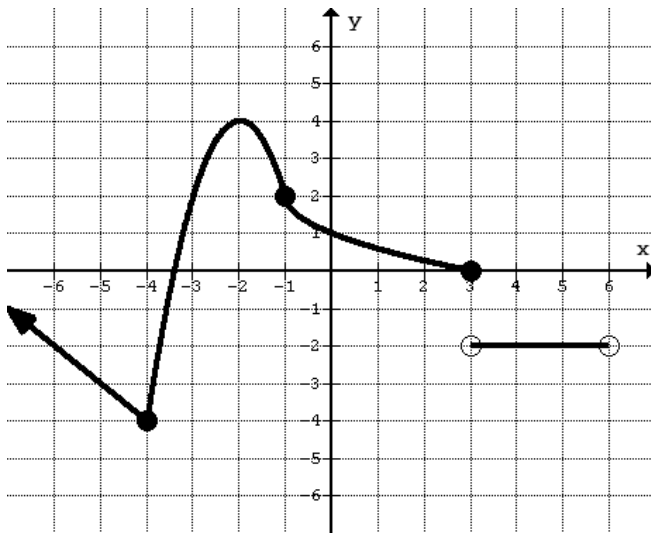
19.   Write the equation for the piecewise functions given below.

a.
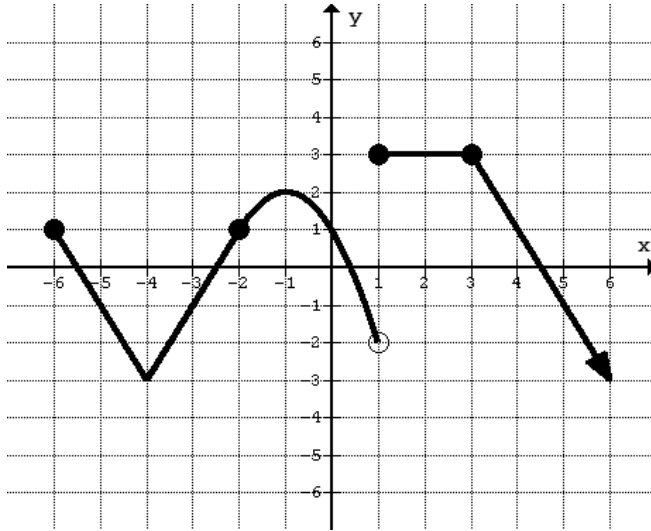
b.

20.   Using the diagram from exercise 19b, answer the following questions:

a.   f(– 1) = _____

b.   f(3) = _____

c.   f(6) = _____

d.   f(f(– 5))= _____