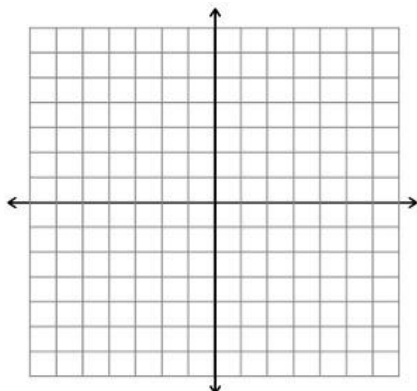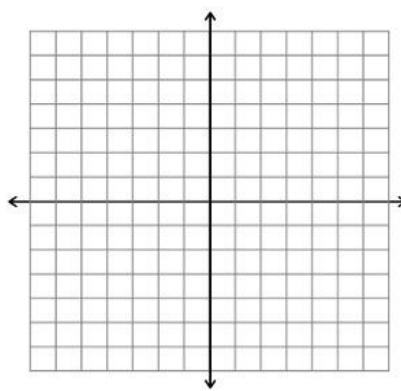## To study for this exam, check all worksheets that I have provided in addition to this review

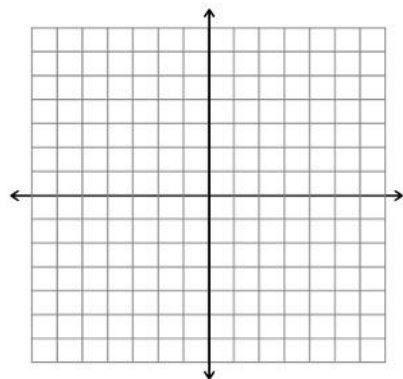1. Graph each functions on the grid given. Label any **locator points**, **x-intercepts**, and **y-intercepts**.
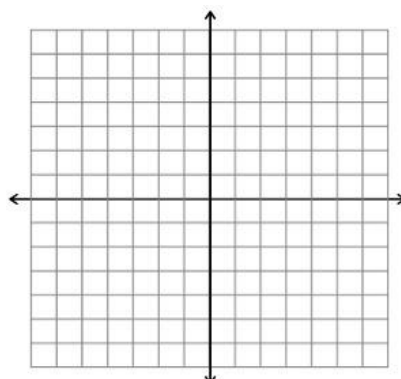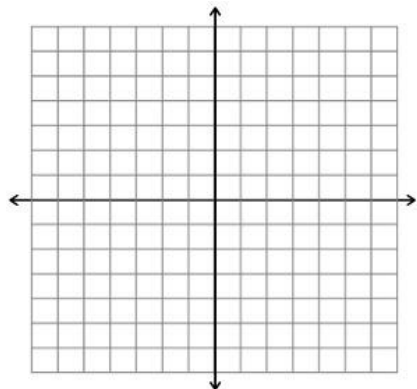
a. $y = (x - 3)^2 - 4$

b. $y = -2|x+1| + 5$

c. $(x+3)^2 + (y-1)^2 = 4$
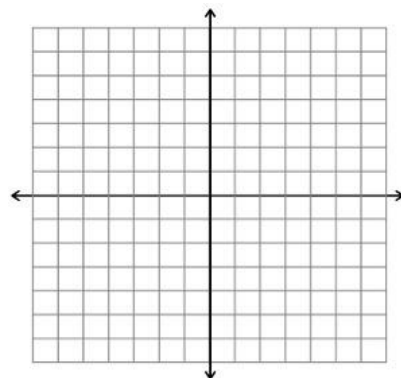
d. $y = -3\sqrt{x+4} + 3$
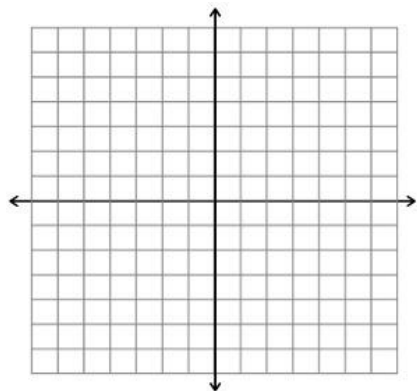
e. $y = 2 \times 2^x - 4$
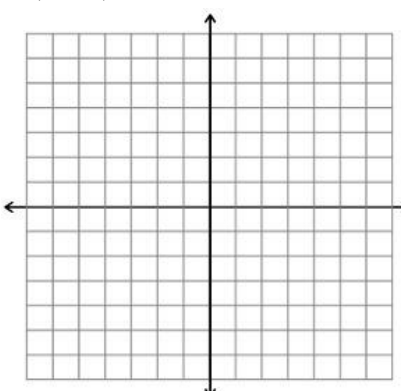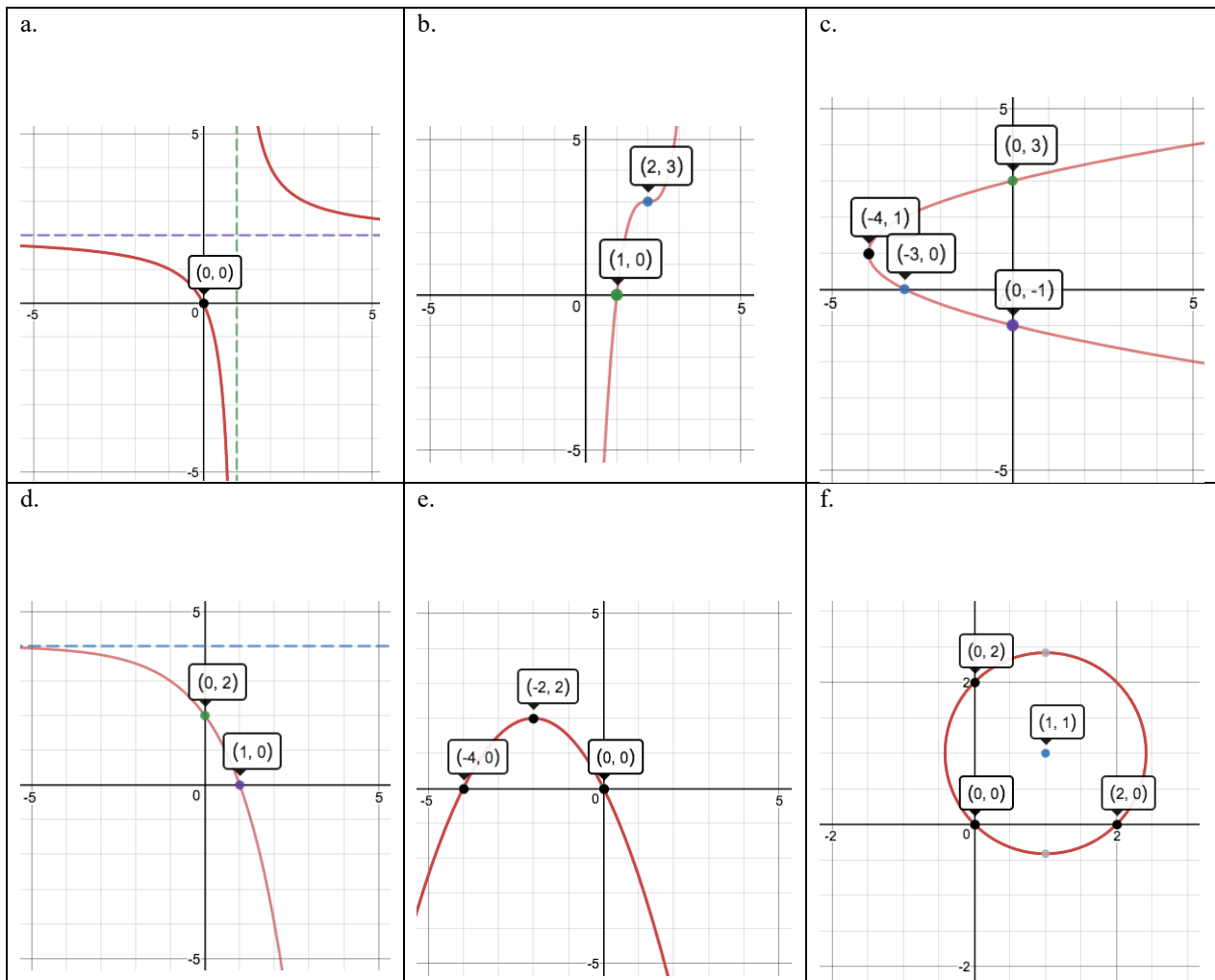
f. $y = \dfrac{6}{x-1} + 3$

g. $y = -2(x+3) + 1$

h. $y = -(x+4)^3 - 1$

2. Find an equation for each of the graphs shown below. Include your calculations of the stretch factor "a", if apply.

a.	b.	c.
(0, 0)	(2, 3) (1, 0)	(0, 3) (-4, 1) (-3, 0) (0, -1)
d.	e.	f.
(0, 2) (1, 0)	(-2, 2) (-4, 0) (0, 0)	(0, 2) (1, 1) (0, 0) (2, 0)

3. For each of the following, find **the equation of a parabola** (either vertex form or standard form) with the features given:

a) x-intercepts are (-1,0) and (3,0), y-intercept at (0,-9)

b) axis of symmetry is $x = -2$, an x-intercept at (-1,0), passes through (-4,9)

c) touches x-axis exactly once at (5,0), y-intercept at (0,-5)

d) crosses the x-axis at -3 and 5 and the y-coordinate of the vertex is 12

4. The Transamerica Pyramid, shown at the right, is an office building in San Francisco. It stands 853 feet tall and is 145 feet wide at its base. Imagine that a coordinate plane is placed over the front of the building. In the coordinate plane, each unit represents one foot, and the origin is at the center of the building's base. Write an absolute value function whose graph is the V-shaped outline of the sides of the building, ignoring the "shoulders" of the building.

Taken from ClassZone.com

6. *Use what you know about area and perimeter to model and solve the following problem:* 500 meters of fencing is available to make 4 rectangular pens of identical shape. Find the dimensions that maximize the area of each pen, according to the diagram below.
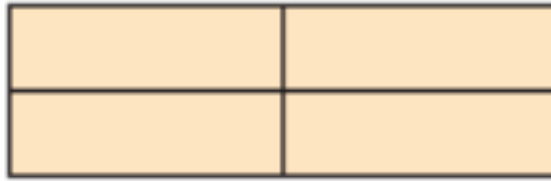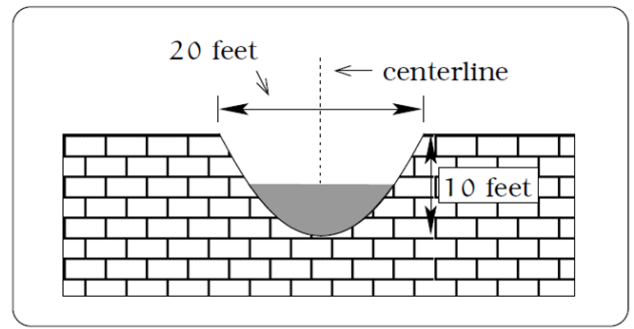
7. At left is the graph of g(x). Use what you know about transformations to find the graphs of each of the following functions on the grids given:

a. $g(x+1) - 2$	b. $-2g(x)$
c. $\|g(x)\|$	d. $g(-x)$
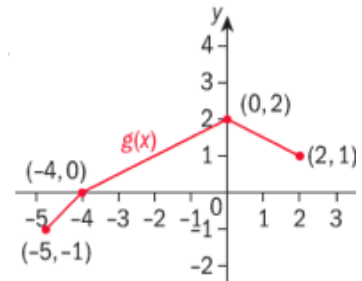
8. A drainage canal has a cross-section in the shape of a parabola. Suppose that the canal is 10 feet deep and 20 feet wide at the top.
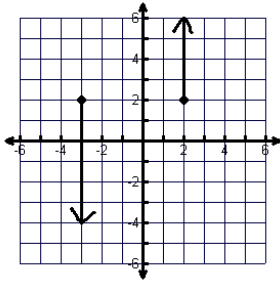
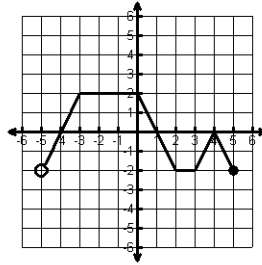   a. Find an equation for the parabola that describes the cross-section shape.

    b. If the water depth in the ditch is 3 feet, how wide is the surface of the water in the ditch?

9. State the domain and range for each graph and then tell if the graph is a function (write yes or no).

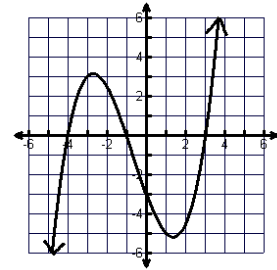a) Domain_____

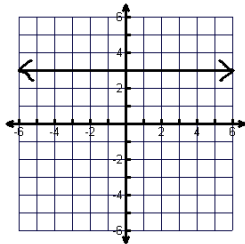   Range_____

   Function?_____

b) Domain_____

   Range_____

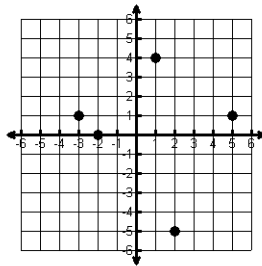   Function?_____

c) Domain_____
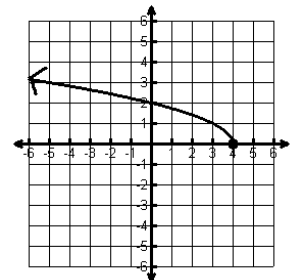
   Range_____

   Function?_____

d) Domain_____

   Range_____

   Function?_____

e) Domain_____

   Range_____

   Function?_____

f) Domain_____

   Range_____

   Function?_____

10. Convert into vertex form ($y = a(x-h)^2 + k$).

a) $g(x) = x^2 + 4x - 10$

b) $h(x) = 2x^2 + 4x - 13$

11. Convert into factored form ($y = a(x-p)(x-q)$).

a) $f(x) = -3(x+1)^2 + 12$

b) $p(x) = \dfrac{5}{4}(x-3)^2 - 5$

12. Convert into standard form ($y = ax^2 + bx + c$).

a) $m(x) = -2(x-3)^2 + 1$

b) $k(x) = 3(2x+1)(x-4)$

13. <u>DESCRIBE (using words) THE TRANSFORMATIONS FOR THE GIVEN EXPRESSIONS</u> from parent functions f(x), g(x), or h(x)

a) f(x − 1) + 2

b) h(x + 7) + 8

c) 2f(x − 1)

d) -3 f(x) + 2

e) ½ g(x) − 9

f) $-^3/_4$h(x + 6)

14. Determine for the pair functions what transformations are occurring **from the first to second function** overall (Not from the parent graph).

a. $y = |x| + 5$ and $y = |x| + 9$

g. $y = x^2 + 3$ and $y = x^2 - 2$

b. $y = |x - 3|$ and $y = |x + 1|$

h. $y = (x-4)^2$ and $y = (x-7)^2$

c. $y = |x - 2| + 4$ and $y = |x| + 4$

i. $y = 2(x+1)^2 + 5$ and $y = 2(x+1)^2$

d. $y = 3|x + 8| + 7$ and $y = 3|x + 8| - 4$

j. $y = x^2 + 2$ and $y = (x+5)^2 + 2$

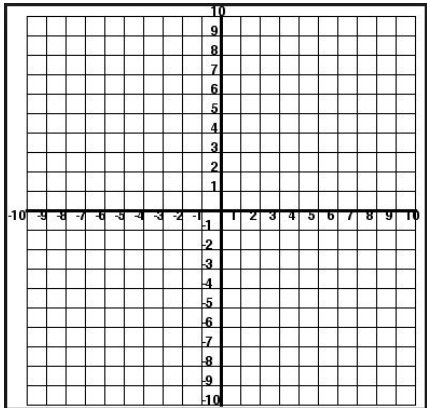e. $y = \frac{1}{3}|x| + 6$ and $y = \frac{1}{3}|x - 6| + 3$

k. $y = (x-4)^2$ and $y = (x+4)^2 + 9$
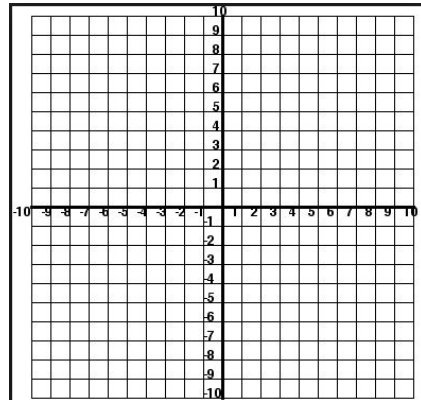
f. $y = |x + 3| - 1$ and $y = |x - 5| - 9$

l. $y = -(x-3)^2 + 2$ and $y = -(x-8)^2 - 6$

15. In the grid provided, **sketch the graph of the given quadratics**. **Accurately label the location** of the vertex, x-intercepts and y-intercept in all graphs (*Convert to the most convenient form for each feature, if possible*)

a) $y = 2x^2 - 6x + 5$

b) $y = -3x^2 + 9x - 1$

16. A baseball is thrown from center field to home plate. If the catcher is standing 300 feet from the center fielder and the ball attains a maximum height of 30 feet, find an equation to model the path of the baseball assuming it follows the path of a parabola. Assume the ball started and ended in players' hands exactly 4 feet above the ground. Show a sketch for the path of the baseball. Label the axes appropriately.

17. Given that $f(x) = x^2 - 3x$ and $g(x) = 7x^2 - 10x - 3$ find:
    a. $g(-1)$

    b. $f(2)$

    c. The values of x, when $f(x) = 10$

    d. The solution of $g(x) = f(x)$

18. Cathy hit a golf ball 180 yards down the fairway. If the ball reached a maximum height of 20 yards, find an equation for the height of the golf ball (y) versus the horizontal distance it has traveled (x). Assume a parabolic path. Show a sketch for the path of the golf ball. Label the axes appropriately.