

# Math Models – Review Quadratic Functions and Equations Assignment 53

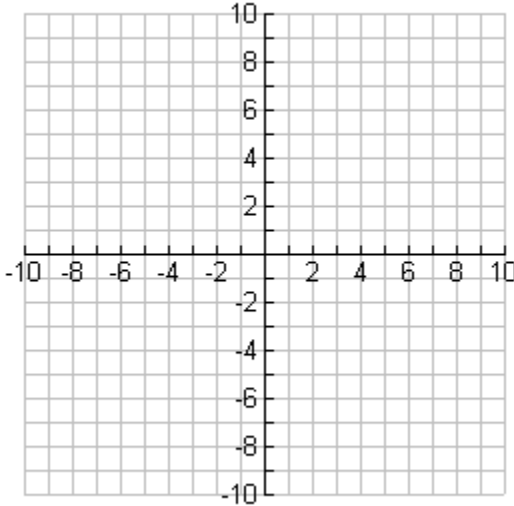
Graph the following equations. Name the vertex and the roots. Write the equation of the axis of symmetry.

1.  $y = x^2 - 6x + 8$

vertex \_\_\_\_\_

roots \_\_\_\_\_

axis of symmetry \_\_\_\_\_

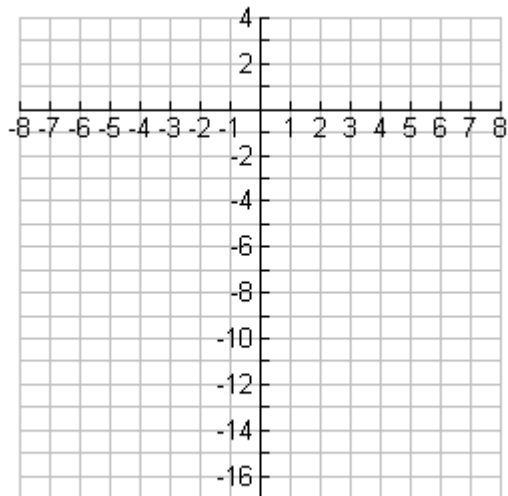


2. List the graphs in order from narrowest to widest.

$y = -x^2 - 4$ ,  $y = 2x^2 + 3$ ,  $y = \frac{1}{5}x^2$ ,  $y = -\frac{1}{2}x^2 + 2$ ,  $y = -5x^2$

3. Solve by graphing.  $x^2 + 2x - 15 = 0$

Solutions \_\_\_\_\_



4. Susie graphs a family of functions in the form  $y = ax^2 - 2$ . How does each new graph compare to the previous graph as Susie increases the value of  $a$  from 1 to 2 and then to 3? Choose the correct word(s) to fill in the blank.

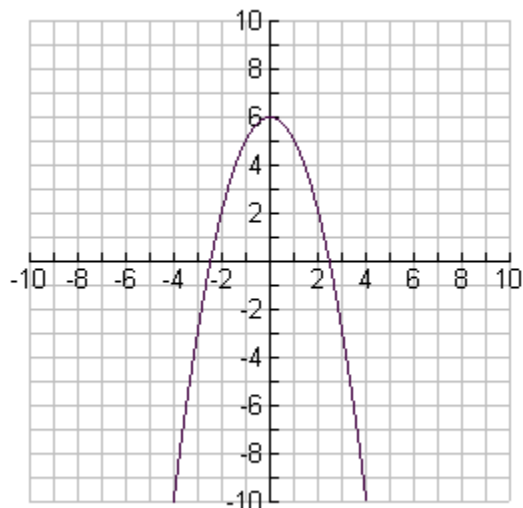
Each new graph is \_\_\_\_\_ the previous graph.

- a. above      b. wider than      c. narrower than      d. right of

5. Bob studied the parabola shown at right.

Which is an accurate conclusion that Jake could make about this parabola?

- a. The vertex is at (6, 0)  
b. The minimum value is at (-2.5, 0)  
c. The maximum value is at (0, 6)  
d. The axis of symmetry is the  $x$ -axis



6. Solve using square root.       $2x^2 + 4 = 22$

Solve by factoring.

7.  $x^2 - 6x - 16 = 0$

Solve using the quadratic formula.

8.  $3x^2 - 5x = -2$

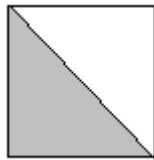
Solve using square root, factoring, or the quadratic formula.

9. The area of a square is described by the equation  $2x^2 = 288$  where  $x$  is the length of a side in feet. What is the length of the side of the square?
- A. 72 ft.      B. 144 ft.      C. 36 ft.      D. 12 ft.
10. The area of a rectangle is given by the equation  $w(w - 3) = 108$  where  $w$  is the width of the rectangle. What is the width?
- A. 6      B. 9      C. 12      D. 18      E. 36
11. The longer leg of a right triangle is 3 inches longer than the shorter leg. The hypotenuse is 15 in long. The following equation shows the relationship between the sides of the triangle  $x^2 + (x + 3)^2 = 225$ . What is the length of the shorter leg?
- A. 6 in      B. 9 in      C. 12 in      D. 18 in      E. 20 in

12. What are the solutions to the equation?  $2x^2 + 8x + 2 = -3x - 10$

- A.  $x = -4, x = \frac{3}{2}$     B.  $x = 4, x = -\frac{3}{2}$     C.  $x = -4, x = -\frac{3}{2}$     D.  $x = 4, x = \frac{3}{2}$

13. A company uses this square figure as its logo in many different sizes throughout its operations.



The table of values describes the shaded area of the square in square units,  $y$ , as a function of the length of a side,  $x$  units.

Which function includes all of the ordered pairs in the table?

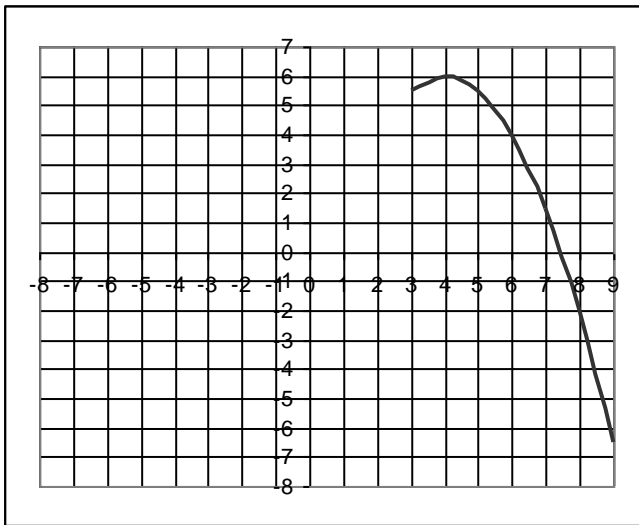
<b>Length of a side, <math>x</math></b>	1	3	4	5	8
<b>Shaded area, <math>y</math></b>	0.5	4.5	8	12.5	32

- A.  $y = x^2 - 1/2$     B.  $y = 2x^2$     C.  $y = 1/2 x^2$

14. In the equation  $y = 2x^2 - 3x - 20$ , which is a value of  $x$  when  $y = 0$ ?

- A. -4                      B. -2.5                      C. -20                      D. 2

15. Part of the graph of a quadratic equation is shown on the coordinate grid.



Between which two integers will the graph again cross the  $x$  axis?

- A. Between -2 and -1                      B. Between -1 and 0                      C. Between 0 and 1  
D. Between 1 and 2                      E. Between 2 and 3

16. What are the roots of the quadratic equation  $x^2 + 5x + 4 = 0$

A. -4 and 1

B. -2 and -2

C. -4 and -1

D. 2 and -2

17. What is the solution set for the equation  $3(2x - 3)^2 = 48$ ?

A.  $\left\{\frac{19}{6}, -\frac{19}{6}\right\}$  B.  $\left\{\frac{19}{2}, -\frac{19}{2}\right\}$  C.  $\left\{\frac{-1}{2}, \frac{7}{2}\right\}$  D.  $\left\{\frac{7}{2}, -\frac{7}{2}\right\}$