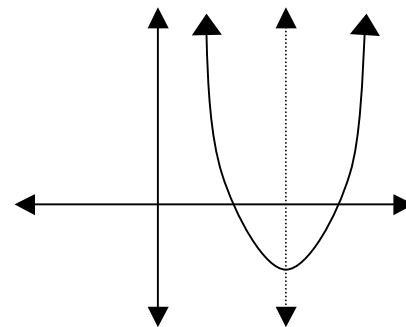


1. Find the axis of symmetry for each parabola below.

- a) vertex at $V(5, 16)$ _____
- b) zeros at 3 and 26 _____
- c) roots at -5 and 19 _____
- d) $y = 2(x - 7)(x + 9)$ _____
- e) $y = 3x^2 - 10x + 7$ _____
- f) $y = 4(x - 2)^2 + 6$ _____



2. If one root is 25 and the vertex is $V(-3, 2)$, find the other root. _____

3. What is the y-coordinate of the vertex of a parabola with exactly one real root? _____

4. What is the y-coordinate of every root of every vertical parabola? _____

5. Consider the vertex of a parabola, it provides some important information.

The x-coordinate is the _____

The y-coordinate is the _____

6. Use the leading coefficients below to analyze the graph of $y = ax^2 + bx + c$.

$a = 5$ opens (up / down) more (narrow / wide) than standard

$a = -3$ opens (up / down) more (narrow / wide) than standard

$a = \frac{1}{2}$ opens (up / down) more (narrow / wide) than standard

$a = -\frac{4}{3}$ opens (up / down) more (narrow / wide) than standard

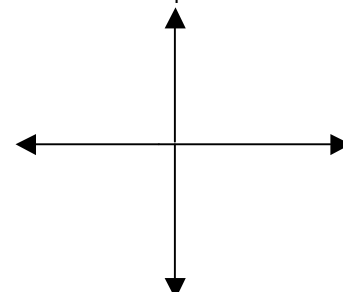
7. Given the following information, place 3 points on the table of values, then sketch the parabola.

the roots are -1 and 5

the vertex is $(2, -3)$

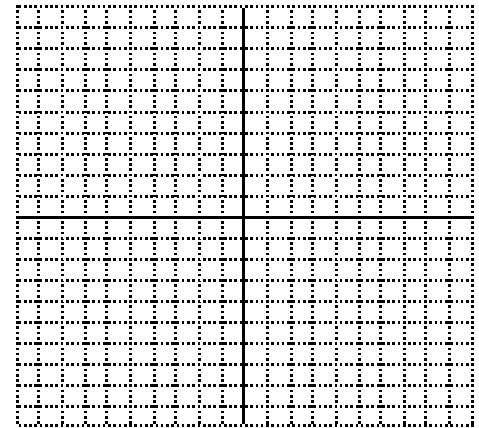
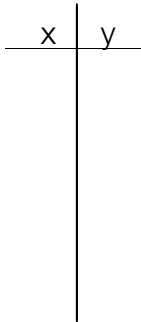
x	y

sketch the parabola



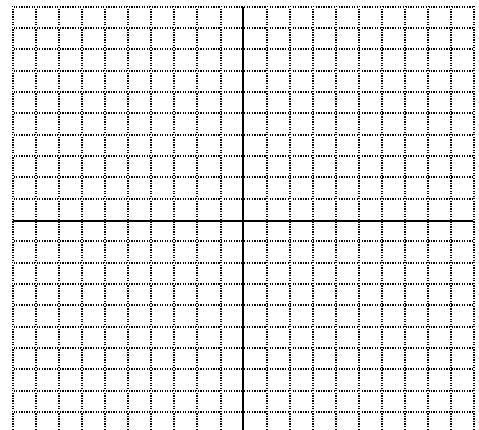
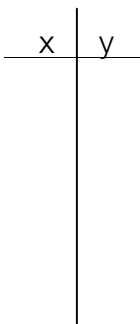
10. Given the quadratic equation: $y = -\frac{1}{4}x^2 + 5$

- a) Find the axis of symmetry. _____
- b) Find the vertex. _____
- c) Does the parabola open up or down? _____
- d) Is there a maximum or a minimum value? What is it? _____
- e) Is this parabola more narrow or wide than its parent graph? _____
- f) Find the y-intercept. _____
- g) Graph the quadratic equation, then find the roots. _____



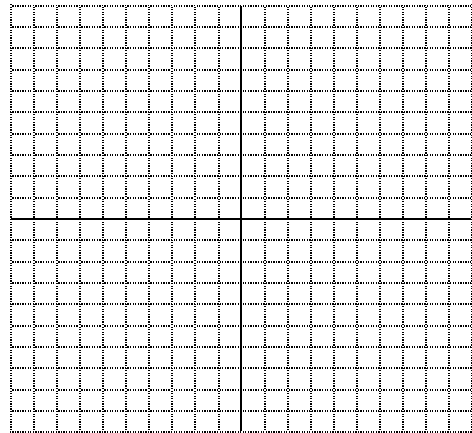
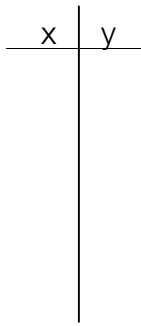
11. Given the quadratic equation: $y = 2(x-3)(x+1)$

- a) Find the axis of symmetry. _____
- b) Find the vertex. _____
- c) Does the parabola open up or down? _____
- d) Is there a maximum or a minimum value? What is it? _____
- e) Is this parabola more narrow or wide than its parent graph? _____
- f) Find the y-intercept. _____
- g) Graph the quadratic equation, then find the roots. _____



12. Given the quadratic equation: $y = \frac{1}{2}(x+4)^2 - 3$

- a) Find the axis of symmetry. _____
- b) Find the vertex. _____
- c) Does the parabola open up or down? _____
- d) Is there a maximum or a minimum value? What is it? _____
- e) Is this parabola more narrow or wide than its parent graph? _____
- f) Find the y-intercept. _____
- g) Graph the quadratic equation, then find the roots. _____



13. Find the vertex of the quadratic equation:

$$y = 2x^2 - 7x - 15$$

14. Consider the quadratic formula. When you find the discriminant, $D = b^2 - 4ac$ it tells you about the nature of the roots of the quadratic equation.

If the discriminant is positive, there are _____ real roots.

If the discriminant is zero, there are _____ real roots.

If the discriminant is negative, there are _____ real roots.

How can you tell if the real roots are rational or irrational?

15. Use the discriminant to determine the nature of the roots of the quadratic equations below.

$$D = b^2 - 4ac$$

Do not find the actual roots.
Find the number of real roots.
If the roots are real, determine if they are rational or irrational.

$$y = 3x^2 + 6x + 3$$

D =

of real roots ____

rational or irrational

$$y = 5x^2 - 5x + 2$$

D =

of real roots ____

rational or irrational

$$y = 5x^2 + 4x - 3$$

D =

of real roots ____

rational or irrational

$$y = 5x^2 + 5x - 10$$

D =

of real roots ____

rational or irrational

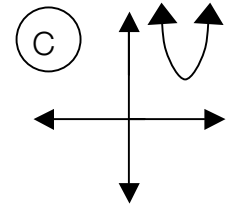
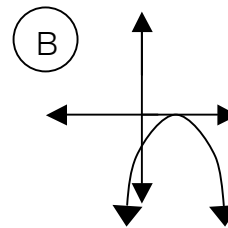
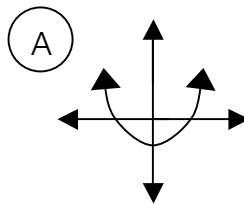
16. Match the graphs below with the possible discriminant (D) value.

_____ D = 81

_____ D = -4

_____ D = 0

_____ D = 18



17. Use the Quadratic Formula to solve the quadratic equations.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$0 = 2x^2 + 9x - 5$$

$$0 = x^2 + 3x + 7$$

$$0 = x^2 + 3x - 9$$

$$0 = x^2 + 2x + 1$$