

# 6.4 Quadratic Formula

Write your questions here!

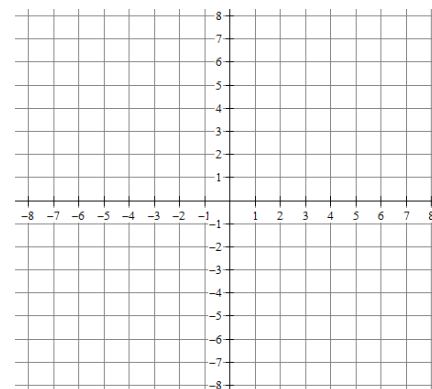


The solutions for the quadratic  $ax^2 + bx + c = 0$  are

$$x =$$

Solve the quadratic equation. Check your solution by graphing.

$$x^2 + 3x =$$



Simplify

$$\frac{4 \pm \sqrt{8}}{6}$$

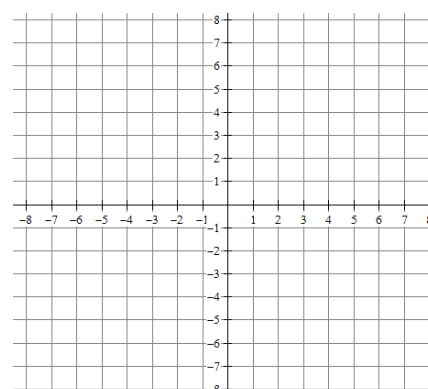
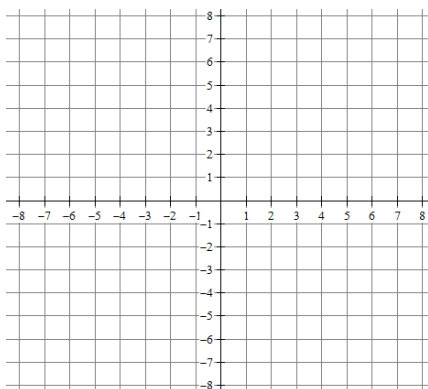
$$\frac{5 \pm \sqrt{-24}}{2}$$

$$\frac{4 \pm \sqrt{17}}{2}$$

Solve the quadratic equation. Check your solution by graphing.

$$-x^2 = -4x +$$

$$25x^2 - 18x = 12x - 9$$



## DISCRIMINANT

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

<b>Discriminant</b>			
<b>Number of Real Solutions</b>			
<b>Sketch of Graph</b>			

How many solutions and what type do each of the following quadratic equations have?

$$2x^2 - 3x + 15 = 0$$

$$x^2 - 10x + 25 = 0$$

$$x^2 + 3x =$$

### SUMMARY:

Now,  
summarize  
your notes  
here!



**Simplify the following if possible.**

1.  $\frac{4 \pm \sqrt{18}}{6}$

2.  $\frac{5 \pm \sqrt{40}}{2}$

3.  $\frac{6 \pm \sqrt{25}}{3}$

4.  $\frac{4 \pm \sqrt{-24}}{8}$

5.  $\frac{6 \pm \sqrt{17}}{12}$

6.  $\frac{3 \pm \sqrt{-11}}{2}$

**Find the discriminant. How many solutions and what type?**

7.  $-5n^2 + 2n - 7 = 0$

8.  $9b^2 - 9b - 4 = 0$

9.  $4n^2 - 8n + 14 = 10$

10.  $10r^2 - 9r - 8 = -10$

11.  $-9a^2 - 4 = -5a$

12.  $8b^2 + 8b = -2$

**Solve using the quadratic formula.**

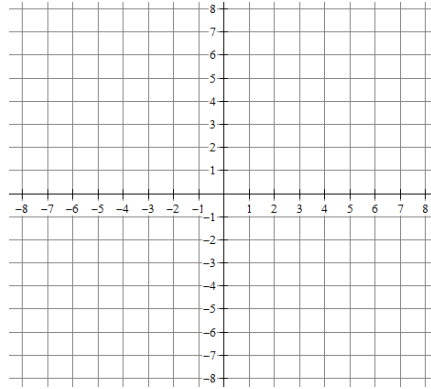
13.  $x^2 - 2x - 5 = 0$

14.  $x^2 - 5x = -6.25$

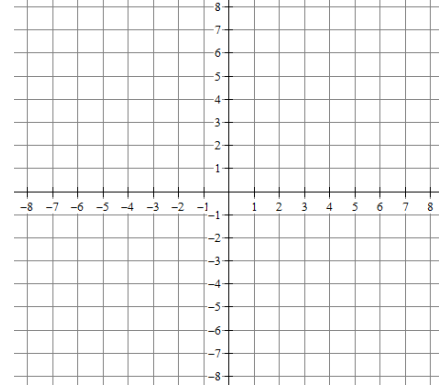
15.  $9x^2 + 10x + 16 = 2x + 9$

**Solve using the quadratic formula. Check your solution by graphing. Label the vertex and the root(s).**

16.  $0 = -2x^2 + 12x - 14$



17.  $-\frac{1}{2}x^2 + 2x - 5 = 0$



**Describe and the correct the error!**

18. Solve.  $0 = 3x^2 - 12x + 24$

$$\frac{12 \pm \sqrt{(-12)^2 - 4(3)(24)}}{2(3)} = \frac{12 \pm \sqrt{-144 - 288}}{6} = \frac{12 \pm \sqrt{-432}}{6} = \frac{12 \pm i\sqrt{432}}{6} = \frac{12 \pm 12i\sqrt{3}}{6} = 2 \pm 2i\sqrt{3}$$

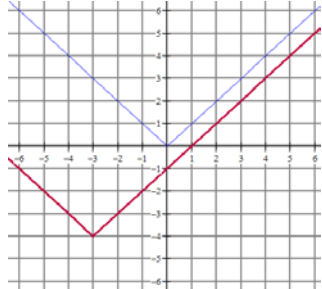


**Algebra Skillz**

**GRAPH**

Below, the graph of  $f(x) = |x + 3| - 4$  is sketched in bold. Its parent function  $f(x) = |x|$  is represented by the thin curve.

1. Describe the translation of the parent graph.



2. How does the translation relate to the equation?

**SIMPLIFY**

3.  $\sqrt{27} - 4\sqrt{3}$

4.  $5(5 + 2\sqrt{3})$

**SOLVE**

5. Solve:  
 $(2x - 5)(3x - 10) = 0$

6. Factor and solve.  
 $x^2 + 10x + 24 = 0$

Solve using the quadratic formula.

1.  $a^2 = -11a - 18$

2.  $-n^2 - 11n = 2 - 4n^2 - 3n$

### ABSOLUTE FUN!

3. Use your knowledge of absolute value functions and quadratics to solve.  $|x^2 - 3x - 14| = 8$   
Before you start, how many real solutions do you think are possible?

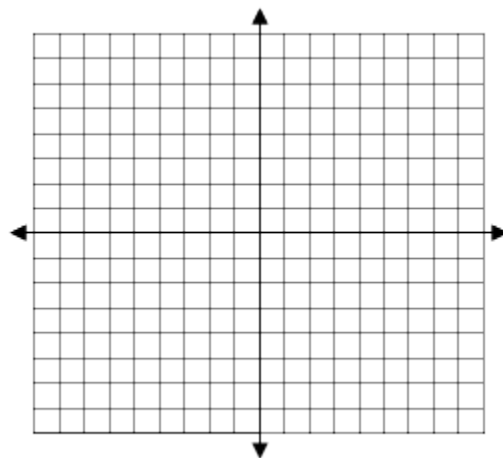
### GRAPH IT!

4. Fill in the table and graph. Check with your graphing calculator!

$$y = \sqrt{0.5x^2 - 3x + 4}$$

$x$	$y$
-8	
-4	
-2	
0	
2	
3	
4	
6	
8	

- a. Find the roots of the quadratic function in the square root. These are also the roots of the entire function because the square root of zero is zero. Plot and label these points on your graph.



- b. Find the axis of symmetry of the quadratic in the square root. How does this relate to your graph?

- c. State the domain and range of this function.

**VERTICAL MOTION** An object that travels up and down is modeled by the quadratic function below:

$$h(t) = -16t^2 + v_0t + h_0$$

$h$  = height of object (feet),  $t$  = time (seconds),  $v_0$  = initial velocity of object (ft/sec),  $h_0$  = initial height of object (feet)

**IMPORTANT:** -16 represents the force of gravity pushing the object down.

5. **FOOTBALL** The Buffalo Bills lose yet another football. In a fit of a rage, Mr. Kelly throws his lucky bobble head Scott Norwood up into the air with a velocity of 98 feet seconds. The bobble head leaves his hand at 7.5 feet.

a. Fill in the formula above so that we can model the height of the bobble head over time.

b. What does  $h(3)$  mean? Find it!



c. What does  $h(t) = 112$  mean? Find it!

d. Mr. Kelly quickly realizes his mistake and plans to catch the bobble head. Unfortunately, like many Bills receivers he is not good at catching and misses Scott Norwood wide right. How long is bobble head Scott Norwood in the air before it smashes into the ground?

**7. SAT PREP**

**MULTIPLE CHOICE**

If  $\epsilon \in p \in = 5 - p^2$ , then find  $\epsilon - 2 \in$ .

- (A) 9
- (B) 1
- (C) -9
- (D) -1
- (E) None of the above

**GRID IN**

$x \cup y = 5x - 2y$ . If  $4 \cup 9 = k \cup 12$ , find the value of  $k$ .

•	•	•	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9