

NAME \_\_\_\_\_

DATE \_\_\_\_\_

QUADRATIC FORMULA: Worksheet 2

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

Identify  $a$ ,  $b$ , and  $c$ . Find the discriminant ( $b^2 - 4ac$ ) and name the number of solutions (0, 1 or 2) for each equation.

1)  $x^2 - 4x - 2 = 0$

2)  $2y^2 + 11y + 30 = 0$

3)  $t^2 + 3t + 2 = 0$

4)  $3x^2 + 4x + 1 = 0$

5)  $2x^2 + 12x = -18$

6)  $2n^2 + 4n + 2 = 0$

Use the quadratic formula to solve each quadratic equation. If necessary, round answers to the nearest hundredth.

7)  $-3x^2 + 5x - 2 = 0$

8)  $4x^2 - 12x + 9 = 0$

9)  $2x^2 - 9x - 221 = 0$

10)  $x^2 - 4x + 10 = 0$

11)  $x^2 - 6x + 7 = 0$

12)  $x^2 + 2x + 2 = 0$

Use the formula  $h_o = -16t^2 + vt + h_i$  to solve the following. If necessary, round answers to the nearest hundredth.

- 13) Brandy tosses a ball upward with a starting velocity of 10 feet per second. She released the ball from a height of 3 feet. If the ball is not caught, how long will the ball be in the air?
- 14) Tom threw a baseball in the air from a height of 6 feet with an initial upward velocity of 14 feet per second. James caught the ball on its way down at a point 4 feet above the ground. How long was the ball in the air before James caught it?

**KEY**

**QUADRATIC FORMULA: Worksheet 2**

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

Identify  $a$ ,  $b$ , and  $c$ . Find the discriminant ( $b^2 - 4ac$ ) and name the number of solutions (0, 1 or 2) for each equation.

1)  $x^2 - 4x - 2 = 0$

$a = 1, b = -4, c = -2$   
 $b^2 - 4ac = 24$   
*Solutions = 2*

2)  $2y^2 + 11y + 30 = 0$

$a = 2, b = 11, c = 30$   
 $b^2 - 4ac = -119$   
*Solutions = 0*

3)  $t^2 + 3t + 2 = 0$

$a = 1, b = 3, c = 2$   
 $b^2 - 4ac = 1$   
*Solutions = 2*

4)  $3x^2 + 4x + 1 = 0$

$a = 3, b = 4, c = 1$   
 $b^2 - 4ac = 4$   
*Solutions = 2*

5)  $2x^2 + 12x = -18$

$2x^2 + 12x + 18 = 0$   
 $a = 2, b = 12, c = 18$   
 $b^2 - 4ac = 0$   
*Solutions = 1*

6)  $2n^2 + 4n + 2 = 0$

$a = 2, b = 4, c = 2$   
 $b^2 - 4ac = 0$   
*Solutions = 1*

Use the quadratic formula to solve each quadratic equation. If necessary, round answers to the nearest hundredth.

7)  $-3x^2 + 5x - 2 = 0$

$a = -3, b = 5, c = -2$   

$$x = \frac{-5 \pm \sqrt{5^2 - 4(-3)(-2)}}{2(-3)}$$

$$x = \frac{-5 \pm \sqrt{1}}{-6} = \frac{-5 \pm 1}{-6}$$

$\{.67, 1\}$

8)  $4x^2 - 12x + 9 = 0$

$a = 4, b = -12, c = 9$   

$$x = \frac{12 \pm \sqrt{(-12)^2 - 4(4)(9)}}{2(4)}$$

$$x = \frac{12 \pm \sqrt{0}}{8} = \frac{12 \pm 0}{8}$$

$\{1.5\}$

9)  $2x^2 - 9x - 221 = 0$

$$a = 2, b = -9, c = -221$$

$$x = \frac{9 \pm \sqrt{(-9)^2 - 4(2)(-221)}}{2(2)}$$

$$x = \frac{9 \pm \sqrt{1849}}{4} = \frac{9 \pm 43}{4}$$

$\{13, -8.5\}$

10)  $x^2 - 4x + 10 = 0$

$$a = 1, b = -4, c = 10$$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(1)(10)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-24}}{2}$$

$b^2 - 4ac < 0$   
Solutions : NONE

11)  $x^2 - 6x + 7 = 0$

$$a = 1, b = -6, c = 7$$

$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(7)}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{8}}{2} = \frac{6 \pm \sqrt{2.83}}{2}$$

$\{4.42, 1.59\}$

12)  $x^2 + 2x + 2 = 0$

$$a = 1, b = 2, c = 2$$

$$x = \frac{-2 \pm \sqrt{2^2 - 4(1)(2)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-4}}{2}$$

$b^2 - 4ac < 0$   
Solutions : NONE

Use the formula  $h_o = -16t^2 + vt + h_i$  to solve the following. If necessary, round answers to the nearest hundredth.

- 13) Brandy tosses a ball upward with a starting velocity of 10 feet per second. She released the ball from a height of 3 feet. If the ball is not caught, how long will the ball be in the air?

$$0 = -16t^2 + 10t + 3$$

$$a = -16, b = 10, c = 3$$

$$t = \frac{-10 \pm \sqrt{10^2 - 4(-16)(3)}}{2(-16)}$$

$$t = \frac{-10 \pm \sqrt{292}}{-32} = \frac{-10 \pm 17.09}{-32}$$

$\{85, -\cancel{2}\}$   
 $t = .75$  seconds

- 14) Tom threw a baseball in the air from a height of 6 feet with an initial upward velocity of 14 feet per second. James caught the ball on its way down at a point 4 feet above the ground. How long was the ball in the air before James caught it?

$$4 = -16t^2 + 14t + 6$$

$$0 = -16t^2 + 14t + 2$$

$$a = -16, b = 14, c = 2$$

$$t = \frac{-14 \pm \sqrt{14^2 - 4(-16)(2)}}{2(-16)}$$

$$t = \frac{-14 \pm \sqrt{324}}{-32} = \frac{-14 \pm 18}{-32}$$

$\{1, -\cancel{3}\}$   
 $t = 1$  second