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NAME _____   DATE _____

QUADRATIC FORMULA: Worksheet 1 $$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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) $x^2 + 4x + 3 = 0$ 2) $x^2 + 3x + 10 = 0$

3) $x^2 - 2x + 1 = 0$ 4) $x^2 + 5x + 2 = 0$

5) $-x^2 + 4x = 2$ 6) $7x^2 - 2x + 1 = 0$

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

7) $2x^2 + 4x - 7 = 0$ 8) $2x^2 + 5x + 3 = 0$

9) $3x^2 + 4x = -30$

10) $5x^2 + 13x - 1 = 0$

11) $5x^2 + 16x - 84 = 0$

12) $7x^2 + 100x - 4 = 0$

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

13) Carol dove into a swimming pool from a 15 foot high diving board. Her initial upward velocity was 8 feet per second. Find the time (t) in seconds it took Carol to enter the water.

14) Jerry threw a ball upward with a starting velocity of 30 feet per second. The ball was 6 feet high when it left his hand. How many seconds (t) did it take for the ball to hit the ground?

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QUADRATIC FORMULA: Worksheet 1

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

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

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

2) $x^2 + 3x + 10 = 0$

$a = 1, b = 3, c = 10$
$b^2 - 4ac = -31$
$Solutions = 0$

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

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

4) $x^2 + 5x + 2 = 0$

$a = 1, b = 5, c = 2$
$b^2 - 4ac = 17$
$Solutions = 2$

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

$-x^2 + 4x - 2 = 0$
$a = -1, b = 4, c = -2$
$b^2 - 4ac = 8$
$Solutions = 2$

6) $7x^2 - 2x + 1 = 0$

$a = 7, b = -2, c = 1$
$b^2 - 4ac = -24$
$Solutions = 0$

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

7) $2x^2 + 4x - 7 = 0$

$a = 2, b = 4, c = -7$
$$x = \frac{-4 \pm \sqrt{4^2 - 4(2)(-7)}}{2(2)}$$
$$x = \frac{-4 \pm \sqrt{72}}{4} = \frac{-4 \pm 8.49}{4}$$

$\{1.12, -3.12\}$

8) $2x^2 + 5x + 3 = 0$

$a = 2, b = 5, c = 3$
$$x = \frac{-5 \pm \sqrt{5^2 - 4(2)(3)}}{2(2)}$$
$$x = \frac{-5 \pm \sqrt{1}}{4} = \frac{-5 \pm 1}{4}$$

$\{1, -1.5\}$

9) $3x^2 + 4x = -30$

$3x^2 + 4x + 30 = 0$
$a = 3, b = 4, c = 30$
$x = \dfrac{-4 \pm \sqrt{4^2 - 4(3)(30)}}{2(3)}$
$x = \dfrac{-4 \pm \sqrt{-344}}{6}$
$b^2 - 4ac < 0$
$Solutions : NONE$

10) $5x^2 + 13x - 1 = 0$

$a = 5, b = 13, c = -1$
$x = \dfrac{-13 \pm \sqrt{13^2 - 4(5)(-1)}}{2(5)}$
$x = \dfrac{-13 \pm \sqrt{189}}{10} = \dfrac{-13 \pm 13.75}{10}$

$\{.075, -2.68\}$

11) $5x^2 + 16x - 84 = 0$

$a = 5, b = 16, c = -84$
$x = \dfrac{-16 \pm \sqrt{16^2 - 4(5)(-84)}}{2(5)}$
$x = \dfrac{-16 \pm \sqrt{1936}}{10} = \dfrac{-16 \pm 44}{10}$

$\{2.8, -6\}$

12) $7x^2 + 100x - 4 = 0$

$a = 7, b = 100, c = -4$
$x = \dfrac{-100 \pm \sqrt{100^2 - 4(7)(-4)}}{2(7)}$
$x = \dfrac{-100 \pm \sqrt{10,112}}{14} = \dfrac{-100 \pm 100.56}{14}$

$\{.04, -14.33\}$

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

13) Carol dove into a swimming pool from a 15 foot high diving board. Her initial upward velocity was 8 feet per second. Find the time (t) in seconds it took Carol to enter the water.

$0 = -16t^2 + 8t + 15$
$a = -16, b = 8, c = 15$
$t = \dfrac{-8 \pm \sqrt{8^2 - 4(-16)(15)}}{2(-16)}$
$t = \dfrac{-8 \pm \sqrt{1024}}{-32} = \dfrac{-8 \pm 32}{-32}$

$\{1.25, -.75\}$

$t = 1.25$ seconds

14) Jerry threw a ball upward with a starting velocity of 30 feet per second. The ball was 6 feet high when it left his hand. How many seconds (t) did it take for the ball to hit the ground?

$0 = -16t^2 + 30t + 6$
$a = -16, b = 30, c = 6$
$t = \dfrac{-30 \pm \sqrt{30^2 - 4(-16)(6)}}{2(-16)}$
$t = \dfrac{-30 \pm \sqrt{1284}}{-32} = \dfrac{-30 \pm 35.83}{-32}$

$\{2.06, -.18\}$

$t = 2.06$ seconds