Solve each quadratic equation by factoring, square roots, and Quadratic Formula. You must use each method once. Round answers to the nearest hundredth when necessary.
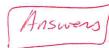
1. $2x^2 - 14 = 3x$

2. $4x^2 - 23x + 17 = 0$

3. $8 - x^2 + 17 + 3x^2 = 49$

4. An object is shot in the air from an initial height of 73 feet with an initial velocity of 152 ft/sec. The following equation models the height of the object as a function of time. $h(t) = -16t^2 + 152t + 73$. Round answers to the nearest hundredth when necessary.

a) Find the time it takes the object to hit the ground.

b) Find the time it takes the object to reach a height of 500 feet.

c) Find the time it takes the object to reach a height of 150 feet.

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Bellwork   Alg 2A   Tuesday, March 14, 2017

Solve each quadratic equation by factoring, square roots, and Quadratic Formula. You must use each method once. Round answers to the nearest hundredth when necessary.

1. $2x^2 - 14 = 3x$

FACTOR

$2x^2 - 3x - 14 = 0$

-28

-7 × +4

-3

	x	+2
2x	$2x^2$	+4x
-7	-7	-14

$(2x-7)(x+2) = 0$

$x = \frac{7}{2}, -2$

2. $4x^2 - 23x + 17 = 0$

QUADRATIC FORMULA

$b^2 - 4ac = 257$

$X = \dfrac{23 \pm \sqrt{257}}{8}$

$X = 4.88, 0.87$

3. $8 - x^2 + 17 + 3x^2 = 49$

SQUARE ROOTS

$2x^2 + 25 = 49$
   -25   -25

$\dfrac{2x^2}{2} = \dfrac{24}{2}$

$x^2 = 12$

$x = \pm\sqrt{12}$

$X = \pm 3.46$

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4. An object is shot in the air from an initial height of 73 feet with an initial velocity of 152 ft/sec. The following equation models the height of the object as a function of time. $h(t) = -16t^2 + 152t + 73$. Round answers to the nearest hundredth when necessary.

a) Find the time it takes the object to hit the ground.

$0 = -16t^2 + 152t + 73$

$b^2 - 4ac = 27,776$

$t = \dfrac{-152 \pm \sqrt{27,776}}{-32}$

$t = -0.46, 9.96$

$t = 9.96 \text{ sec}$

b) Find the time it takes the object to reach a height of 500 feet.

$500 = -16t^2 + 152t + 73$
-500   -500

$0 = -16t^2 + 152t - 427$

$b^2 - 4ac = -4224$

The object **doesn't** reach a height of 500 ft.

c) Find the time it takes the object to reach a height of 150 feet.

$150 = -16t^2 + 152t + 73$
-150   -150

$0 = -16t^2 + 152t - 77$

$b^2 - 4ac = 18,176$

$t = \dfrac{-152 \pm \sqrt{18,176}}{-32}$

$t = 0.54 \text{ sec}, 8.96 \text{ sec}$

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