Bellwork Alg 2 Wednesday, October 17, 2018

Find all Complex solutions (real and imaginary) for each quadratic equation. You must use each of the following methods at least once: Factoring, Square Roots, Quadratic Formula, and Completing the Square. Round real answers to the nearest hundredth and give imaginary answers in EXACT simplified form.

1. $2x^2 - 6x = 56$

2. $x^2 + 13 = 4x$

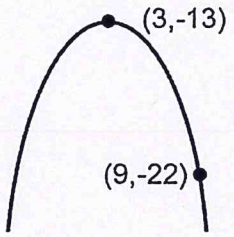
3. $2(x-8)^2 + 13 = 63$

4. $4x^2 - 4x + 19 = 0$

5. $x^2 + 10x - 24 = 0$

6. $3x^2 + 47 = 11$

7. Write the equation of this quadratic in Vertex Form.



8. Factor Completely. $28x^5 - 119x^3 - 350x$

9. A ball is shot into the air from the top of a 75 foot tall building. The following equation models the objects height h (ft) as a function of time t (sec) after launch. $h(t) = -16t^2 + 240t + 75$ Round to the nearest hundredth.

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

b) Find the amount of time it takes for the object to reach a height of 200 feet.

c) Find the amount of time it takes to reach its maximum height.

Bellwork Alg 2 Wednesday, October 17, 2018 **ANSWERS**

Find all Complex solutions (real and imaginary) for each quadratic equation. You must use each of the following methods at least once: Factoring, Square Roots, Quadratic Formula, and Completing the Square. Round real answers to the nearest hundredth and give imaginary answers in EXACT simplified form.

1. $2x^2 - 6x = 56$ FACTOR

$-56 \quad -56$

$\frac{2x^2-6x-56}{2} = \frac{0}{2}$

$x^2 - 3x - 28 = 0$

-28, -7, $+4$, -3

$(x-7)(x+4)=0$

$x = -4, 7$

2. $x^2 + 13 = 4x$ Complete the square

$x^2 - 4x + 4 = -13 + 4$

$(x-2)^2$

$\sqrt{(x-2)^2} = \sqrt{-9}$

$x - 2 = \pm 3i$

$+2 \quad +2$

$x = 2 \pm 3i$

3. $2(x-8)^2 + 13 = 63$ SQ ROOTS

$-13 \quad -13$

$\frac{2(x-8)^2}{2} = \frac{50}{2}$

$\sqrt{(x-8)^2} = \sqrt{25}$

$x - 8 = \pm 5$

$x = 3, 13$

4. $4x^2 - 4x + 19 = 0$ Quadratic Formula

$b^2 - 4ac = -288$

$x = \frac{4 \pm \sqrt{-288}}{8} \rightarrow 144.2$

$x = \frac{4 \pm 12i\sqrt{2}}{8} = \frac{1 \pm 3i\sqrt{2}}{2}$

5. $x^2 + 10x - 24 = 0$ FACTOR

-24, $+12$, -2, $+10$

$(x+12)(x-2)=0$

$x = -12, 2$

6. $3x^2 + 47 = 11$ SQ ROOTS

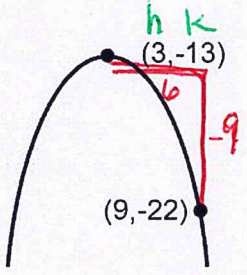
$-47 \quad -47$

$\frac{3x^2}{3} = \frac{-36}{3}$

$\sqrt{x^2} = \sqrt{-12} \rightarrow 4.3$

$x = \pm 2i\sqrt{3}$

7. Write the equation of this quadratic in Vertex Form.



$y = a(x-3)^2 - 13$

$y = -\frac{1}{4}(x-3)^2 - 13$

THIS FUNCTION

$a = \frac{-9}{36} = -\frac{1}{4}$

$6 \overline{)-9}$

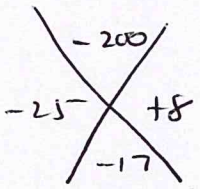
Parent Function

$6 \overline{)36}$

8. Factor Completely. $28x^5 - 119x^3 - 350x$

$7x(4x^4 - 17x^2 - 50) = 7x(x^2+2)(4x^2-25)$

$= 7x(x^2+2)(2x \pm 5)$



	$4x^2$	-25
x^2	$4x^4$	$-25x^2$
$+2$	$+8x^2$	-50

9. A ball is shot into the air from the top of a 75 foot tall building. The following equation models the objects height h (ft) as a function of time t (sec) after launch. $h(t) = -16t^2 + 240t + 75$ Round to the nearest hundredth.

a) Find the amount of time it takes for the object to hit the ground. $h = 0$

$0 = -16t^2 + 240t + 75$ use quadratic Formula

$b^2 - 4ac = 62{,}400$

$t = \dfrac{-240 \pm \sqrt{62{,}400}}{-32}$

$t = -0.31$ & 15.31

$t = 15.31$ sec

b) Find the amount of time it takes for the object to reach a height of 200 feet. $h = 200$

$200 = -16t^2 + 240t + 75$ use quadratic Formula

$-200 \qquad\qquad -200$

$0 = -16t^2 + 240t - 125$

$b^2 - 4ac = 49{,}600$

$t = \dfrac{-240 \pm \sqrt{49{,}600}}{-32} = 0.54$ & 14.46 sec

c) Find the amount of time it takes to reach its maximum height.

vertex

(t, h)

LOS: $t = \dfrac{-b}{2a} = \dfrac{-240}{-32} = 7.5$ sec