

Name: _____ Date: _____

Solving Quadratic Equations Using Square Roots

UNIT QUESTION: How are real life scenarios represented by quadratic functions?

Today's Question: When does a quadratic have an imaginary solution? MCC9-12.A.REI.4b

Solving Quadratic Equations Using Square Roots

1. Get x^2 by itself.
2. Take the square root of both sides of the equation.
3. There will ALWAYS be a positive answer and a negative answer.
4. Check your answers!!!

Solve each equation.

1. $x^2 - 4 = 0$

$$x^2 = +4$$

$$\sqrt{x^2} = \sqrt{+4}$$

$$x = \pm 2$$

2. $\frac{1}{2}x^2 + 3 = 12$

$$2. \frac{1}{2}x^2 = 9 \cdot 2$$

$$x^2 = 18$$

$$\sqrt{x^2} = \sqrt{18} \cdot 2 \quad x = \pm 3\sqrt{2}$$

3. $2(x^2 - 5) = -x^2 - 1$

$$2x^2 - 10 = -x^2 - 1$$

$$+x^2 + 10 \quad +x^2 + 10$$

$$3x^2 = 9$$

$$x^2 = 3 \quad \sqrt{x^2} = \sqrt{3} \quad x = \pm\sqrt{3}$$

4. $\frac{1}{3}(x+4)^2 - 1 = 5$

$$3. \frac{1}{3}(x+4)^2 = 6 \cdot 3$$

$$\sqrt[3]{(x+4)^2} = \sqrt{18}$$

$$x+4 = \pm 3\sqrt{2} \quad x = -4 \pm 3\sqrt{2}$$

5. $\frac{4(x+5)^2}{4} = \frac{-64}{4}$

$$\sqrt{(x+5)^2} = \sqrt{-16}$$

$$x+5 = \sqrt{-16}$$

no real soln

6. $2x^2 + 338 = 0$

$$2x^2 = -338$$

$$\sqrt{x^2} = \sqrt{-169}$$

no real
soln

7. $\frac{5(x-4)^2}{5} = \frac{125}{5}$

$$\sqrt{(x-4)^2} = \sqrt{25}$$

$$x-4 = \pm 5$$

$$x = \pm 5 + 4 \quad x = 9 \quad x = -1$$

8. $\frac{1}{7}x^2 - 3 = 4$

$$7. \frac{1}{7}x^2 = 7 \cdot 7$$

$$\sqrt{x^2} = \sqrt{49}$$

$$x = \pm 7$$

9. $-\frac{3}{5}x^2 - 2 = -5$

$$-\frac{5}{3} \cdot -\frac{3}{5}x^2 = -3 \cdot \frac{5}{3}$$

$$x^2 = \frac{15}{3}$$

$$x^2 = 5$$

$$\sqrt{x^2} = \sqrt{5}$$

$$x = \pm\sqrt{5}$$

10. $\frac{-9x^2}{9} = \frac{243}{-9}$

$$\sqrt{x^2} = \sqrt{-27}$$

no real

soln