

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

LEARNING OBJECTIVE: We will find positive solutions for equations involving square roots and cube roots. (G8M7L5)

ACTIVATING PRIOR KNOWLEDGE:

We can solve linear equations (solve for x)

$-2(5x - 3) = x + 28$ $\begin{array}{r} -10x + 6 = x + 28 \\ +10x \quad +10x \\ \hline 6 = 11x + 28 \\ -28 \quad -28 \\ \hline -22 = 11x \\ \frac{-22}{11} = \frac{11x}{11} \\ \boxed{x = -2} \end{array}$	$27x - 15 = 6x - 78$
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CONCEPT DEVELOPMENT:

Solving non-linear equations has some of the same elements...our goal remains the same in solving equations:

FIND X. Isolate the Variable

We can simplify the expressions until we have the form of $x^2 = p$ or $x^3 = p$ and then take the square root or cube root of both sides of the equation to solve for x.

Example:

$$x^3 + 9x = \frac{1}{2}(18x + 54)$$

$$x^3 + 9x = 9x + 27$$

$$\sqrt[3]{x^3} = \sqrt[3]{27}$$

$$\boxed{x = 3}$$

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GUIDED PRACTICE:**Steps to Solving Equations Involving Square Roots and Cube Roots**

1. Use the properties of equality to transform the equation to the form of $x^2 = p$ or $x^3 = p$.
2. Solve for x by taking the square root (or cube root) of both sides of the equation.
3. Check your work by substituting the positive solution for your unknown value into the exercise.

$x^2 + 4x = 4(x + 16)$	$x^2 - 14 = 5x + 67 - 5x$
$x(x + 4) - 3 = 2(2x + 39)$ $x^2 + 4x - 3 = 4x + 78$ $\sqrt{x^2 + 4x - 3} = \sqrt{4x + 78}$ $\sqrt{x^2 + 4x + 3} = \sqrt{4x + 78}$ $\sqrt{x^2 + 4x + 3} = \sqrt{4x + 78}$ $x = 9$	$x(x - 1) = 121 - x$ $x^2 - x = 121 - x$ $\sqrt{x^2} = \sqrt{121}$ $x = 11$

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A square yard has a side length $2x - 1$ and an area of 121 square yards. What is the value of x ?



$$\sqrt{(2x-1)^2} = \sqrt{121}$$

$$2x-1 = 11$$

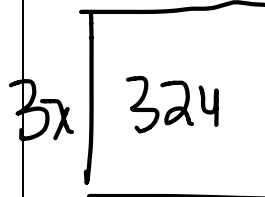
$$+1 \quad +1$$

$$2x = 12$$

$$\boxed{x = 6}$$

$$\begin{array}{|c|c|} \hline 2x-1 & 2x-1 \\ \hline 4x^2-2x & -2x+1 \\ \hline \end{array}$$

A square has a side length of $3x$ and an area of 324 square inches. What is the value of x ?



$$\sqrt{(3x)^2} = \sqrt{324}$$

$$3x = 18$$

$$\boxed{x = 6}$$

$$(3x)^2 = 324$$

$$\frac{9x^2}{9} = \frac{324}{9}$$

$$x^2 = 36$$

$$x = 6$$

$$(4x)^3 = 1,728$$

$$\frac{64x^3}{64} = \frac{1728}{64}$$

$$\sqrt[3]{x^3} = \sqrt[3]{27}$$

$$\boxed{x = 3}$$

$$-3x^3 + 14 = -67$$

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$x(2x^2 - 5) + 3x = -2x + 1024$	$216 + x = x(x^2 - 5) + 6x$
<p>$(6\sqrt{2x})^2 - 2x = \frac{1}{2}(144 - 4x)$</p> <p>$36 \cdot 2x - 2x$</p> <p>$72x - 2x = 72 - 2x$</p> <p>$x = /$</p>	$(2\sqrt{x})^2 - (6x + 2) = 3(3 - 2x) + 29$

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INDEPENDENT PRACTICE:

No ind Prac. Can give out homework

CLOSURE:

Solve for x:

$$\frac{1}{2}(2x^2 + 10) = 30$$

NOTES:

Aligns to lesson 5 grade 8 module 7. Homework should be problem set from lesson 5.