Algebra 2 - Unit 2 Lesson 2: Two Step Equations

- Day 1: Basic Operations
- Day 2: Radicals and Exponents
- Day 3: Logarithms and Exponentials

Refresher - Solve the following:

$$\frac{2}{5} \cdot \frac{5}{2}(-4 + x) = -15 \cdot \frac{2}{1} \cdot \frac{2}{5}$$

$$-4 + x = \frac{-30}{5}$$

$$-4 + x = -6$$

$$+4 \qquad +4$$

$$x = -2$$

$$-10 - \frac{x}{6} = -3$$

$$+10 \qquad \qquad +10$$

$$-6 \cdot -\frac{x}{6} = 7 \cdot -6$$

$$x = -42$$

Reminder: Watch out for solving problems with x raised to even powers. In these situations you will either have 2 solutions or no real solutions.

PEMDAS

· Two Solutions:

$$4x^2 = 36$$
$$\frac{}{4} \qquad \frac{}{4}$$

$$\sqrt{x^2} = \pm\sqrt{9}$$

$$x = \pm 3$$

Once you get your x (raised to the power) by itself, look to see if it is supposed to equal a <mark>positive</mark> or a negative.

$$x = 3 \ \& -3$$

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No real solutions:

$$2 \cdot \frac{x^6}{2} = -5 \cdot 2$$

$$x^6 = -10$$

No Real Solutions

Solve: $2 \cdot \dfrac{\sqrt[5]{x}}{2} = -1 \cdot 2$

For Solving, you want to treat the radical like parentheses, where you deal with it last.

$$\left(\sqrt[5]{x}\right)^5 = (-2)^5$$

$$X = -32$$

Solve: $-6 + \sqrt{x} = 19$

$+6 \phantom{+\sqrt{x}} +6$

$$\left(\sqrt{x}\right)^2 = (25)^2$$

$$X = 25^2$$

$$= 625$$

WARNING! Pay attention to problems where x is raised to even powers!

Two Solutions Problems:

Solve: $-2 \cdot \dfrac{-x^4}{2} = -16 \cdot -2$

$\sqrt[4]{x^4} = \pm \sqrt[4]{32}$

$x = \pm \sqrt[4]{32}$

Keep following the order of operations backwards.

Here you should multiply by -2, then 4th root both sides.

$\dfrac{3}{2} \cdot \dfrac{4}{1} \overset{\frac{3}{2}}{\not=} \dfrac{2}{3}x^6$

$\pm \sqrt[6]{6} = \sqrt[6]{x^6}$

$x = \pm \sqrt[6]{6}$

No Real Solutions Problems:

Solve: $5 + x^2 = 4$

$-5 \qquad -5$

$x^2 = -1$

-5 from both sides.

See how you have x squared equaling an negative number? That's not possible with real numbers.

No Real Solutions

$-5 \cdot -\dfrac{x^6}{5} = 3 \cdot -5$

$x^6 = -15$

No Real solutions

More one solution problems:

When x is not raised to an even power, we don't have to worry about anything special.

$$-7 + x^3 = 20$$

$+7 \qquad +7$

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

$$x = 3$$

$$\frac{4}{3} \cdot \frac{3}{4}x^7 = -6 \cdot \frac{4}{3}$$

$$\sqrt[7]{x^7} = \sqrt[7]{-8}$$

$$x = \sqrt[7]{-8}$$

Solve: $\sqrt{\left(\dfrac{x}{2}\right)^2} = \sqrt{36}$

$$2 \cdot \dfrac{x}{2} = \pm 6 \cdot 2$$

$$x = \pm 12$$

$+6 \cdot 2$

12

$-6 \cdot 2$

-12

$$\sqrt[3]{(-4+x)^3} = \sqrt[3]{-8}$$

$$-4 + x = -2$$
$$+4 \qquad\qquad +4$$

$$x = 2$$

Solve:

$$\left(\sqrt[3]{x-2}\right)^3 = \left(-4\right)^3$$

$$x - 2 = -64$$

$$+2 \qquad +2$$

$$x = -62$$

$$\left(\sqrt[2]{\frac{2}{7}x}\right)^2 = \left(4\right)^2$$

$$\frac{7}{2} \cdot \frac{2}{7}x = \frac{\overset{8}{\cancel{16}}}{1} \cdot \frac{7}{\cancel{2}}$$

$$x = 56$$

Homework:

Unit 2 Lesson 2 Day 2 Worksheet