

Algebra 2 - Unit 2 Lesson 4 (U2.4)

Multi-Step Equation Solving

Today's lesson is not going to be very long. I'll be going over a few new things you can see, but other than that it's just more of the same. Most of today will be spent working on the worksheet and asking questions if you need help. You will have a QA over this lesson tomorrow.

Reminder: Always follow the order of operations Backwards to figure out what order to do your steps. Take it one step at a time.

$$\text{Ex: } -7 + \frac{2}{3} \left(\frac{3x+1}{5} \right) = -3$$

+7
+7

$$\frac{3}{2} \cdot \frac{2}{3} \left(\frac{3x+1}{5} \right) = 4 \cdot \frac{3}{2}$$

$$5 \cdot \frac{(3x+1)}{5} = 6 \cdot 5$$

$$3x + 1 = 30$$

$$-1 \quad -1$$

$$\frac{3x}{3} = \frac{29}{3}$$

$$x = \frac{29}{3}$$

U2 L4 - Multi-Step Equations

$$\text{Ex: } (3x - 5)^3 - 7 = 1$$
$$\begin{array}{c} +7 \quad +7 \\ \sqrt[3]{(3x - 5)^3} = \sqrt[3]{8} \end{array}$$

$$3x - 5 = 2$$
$$\begin{array}{c} +5 \quad +5 \end{array}$$

$$\frac{3x}{3} = \frac{7}{3}$$

$$x = \frac{7}{3}$$

Order of Operations Backwards:

SADMEP

$$\text{Ex: } \frac{1}{2} \left(\frac{\sqrt[3]{2x+1}}{3} \right) - 6 = -5$$

$+6 \quad +6$

$$2. \quad \frac{1}{2} \left(\frac{\sqrt[3]{2x+1}}{3} \right) = 1 \cdot 2$$

$$3. \quad \frac{\sqrt[3]{2x+1}}{3} = 2 \cdot 3$$

$$\left(\sqrt[3]{2x+1} \right)^3 = (6)^3$$

$$2x+1 = 216$$

$-1 \quad -1$

$$\frac{2x}{2} = \frac{215}{2}$$

$$x = \frac{215}{2}$$

For problems where your x term is in the denominator, do this:

1. Get the fraction x is with by itself.
2. Multiply both sides by the denominator (the part w/ x in it)
3. Now keep solving like you would a previous problem.

Ex: $\frac{2}{\sqrt{x-4}} + 6 = 8$

-6 -6

$\sqrt{x-4} \cdot \frac{2}{\sqrt{x-4}} = 2 \cdot \sqrt{x-4}$

$\frac{2}{2} = \frac{2\sqrt{x-4}}{2}$

$1^2 = \sqrt{x-4}^2$

$1 = x - 4$

+4 +4

$5 = x$

U2 L4 - Multi-Step Equations

$$\text{Ex: } -4 = \frac{3}{5} \left(\frac{5^x}{2} \right) - 7$$

+7 +7

$$\frac{5}{3} \cdot 3 = \frac{3}{5} \left(\frac{5^x}{2} \right) \cdot \frac{5}{3}$$

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

$$10 = 5^x$$

convert

$\log_5 10 = x$

$$\cancel{10 = 5^x}$$
$$\cancel{\frac{10}{5} = \frac{5^x}{5}}$$

U2 L4 - Multi-Step Equations

$$\text{Ex: } 11 = 5 \log_2(-1+x) + 8$$

-8

-8

$$\frac{3}{5} = \frac{5 \log_2(-1+x)}{5}$$

$$\frac{3}{5} = \log_2(-1+x)$$

$$2^{\frac{3}{5}} = -1+x$$

$$2^{\frac{3}{5}} + 1 = x$$

Homework:

U2.4 Worksheet