Review of Radicals and Quadratic Equations - Lesson 9-1

Here's your warmup!

Write each number as the product of two whole-number factors where one of the factors is a perfect square.

12

27

50

48

72

54

If $(\sqrt{7})^2 = (\sqrt{7})(\sqrt{7}) = 7$, then

$(3\sqrt{7})^2 =$

Today, we're reviewing how to reduce square roots to simplified radical form - the only form I'll accept! Let's start by trying to factor the number under the square root symbol. We are looking for factors that are perfect squares so that we can take the square root of those:

$$\sqrt{50} = \sqrt{25 \cdot 2} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$$

$$\sqrt{84} = \sqrt{4 \cdot 21} = \sqrt{4}\sqrt{21} = 2\sqrt{21}$$

However, I think that's a pain, so I want to teach you the "Square Root Jail" method. Here are a few examples of how that works. If you don't remember how to do it, make sure to come to extra help!!!

$\sqrt{84} = 2\sqrt{21}$

2	2	42
	2	21
	3	7
	7	1

$\sqrt{240} = 4\sqrt{15}$

2	2	120
	2	60
2	2	30
	2	15
	3	5
	5	1

At this point, we can look at simplifying square roots that are being multiplied together:

$$\sqrt{3}\sqrt{2} = \sqrt{6}$$

$$(\sqrt{5})^2 = 5$$

$$(2\sqrt{3})^2 = (2\sqrt{3})(2\sqrt{3}) = (2^2)(\sqrt{3})^2 = 4 \cdot 3 = 12$$

Next, we'll look at how to simplify the square roots of fractions. Remember - never leave a square root in the denominator of a fraction!!

$$\sqrt{\frac{2}{3}} = \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{2}}{\sqrt{3}}\left(\frac{\sqrt{3}}{\sqrt{3}}\right) = \frac{\sqrt{6}}{3}$$

See if you can do this one:

$$\sqrt{\frac{5}{8}} =$$

Lastly, we'll end by learning how to factor quadratics where the leading coefficient is not 1…this technique is called "slide and divide."

Practice this one with me on the video:

$2x^2 - 3x - 35 = 0$

Then try this one on your own:

$12x^2 + 11x - 15 = 0$