Algebra 1: 6.3 Properties of Radicals

Simplify the following: $\frac{\sqrt{18}}{3}$

Break 18 into a product of a number you know the square root of and some other #. Choose the Largest Perfect Square as a factor.

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, etc...

Product Property

$\sqrt{18} = \sqrt{9 \cdot 2} = \sqrt{9} \cdot \sqrt{2} = 3\sqrt{2}$

so... $\frac{\sqrt{18}}{3} = \frac{3\sqrt{2}}{3} = \sqrt{2}$

Simplify $\frac{\sqrt{112}}{8} = \frac{\sqrt{16 \cdot 7}}{8}$

$= \frac{\sqrt{16} \cdot \sqrt{7}}{8} = \frac{4\sqrt{7}}{8_2} = \frac{\sqrt{7}}{2}$

6.3 Properties of Radicals

Simplify $\sqrt{\frac{15}{64}}$

$= \frac{\sqrt{15}}{\sqrt{64}} = \frac{\sqrt{15}}{8}$

Quotient Property:

you can apply the $\sqrt{}$ to top & bottom separately

Simplify $\sqrt{\frac{81}{x^2}} = \frac{\sqrt{81}}{\sqrt{x^2}} = \frac{9}{x}$

convert $\sqrt{x^2}$ to a rational Exponent (Lesson 6.2) to see what happens.

$\sqrt{x^2} = x^{2/2} = x^1$ or x

$\sqrt[\text{root}]{\text{base}^{\text{Power}}} = \text{base}^{\frac{\text{Power}}{\text{root}}}$

Adding and Subtracting Radicals:

Radicals (of the same number) are "Like Terms". Treat them as you would "x" when adding/subtracting.

Ex: Simplify $3\sqrt{3} - 6\sqrt{3} + \sqrt{3} = -2\sqrt{3}$

Treat Like $3x - 6x + 1x$

$-3x + 1x$

$-2x$

Ex: Simplify $4\sqrt{7} - 6\sqrt{63} = 4\sqrt{7} - 6 \cdot 3\sqrt{7}$

$= 4\sqrt{7} - 18\sqrt{7}$

$= -14\sqrt{7}$

simplify

$\sqrt{63} = \sqrt{9 \cdot 7} = \sqrt{9} \cdot \sqrt{7} = 3\sqrt{7}$

Homework:

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