Math in Living C O L O R !!

3.03 Reducing Fractions with Radicals

Intermediate Algebra: One Step at a Time. Page 256- 258: #22

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See Section 3.03, with explanations, examples, and exercises, coming soon!

P. 258: 22.
$$\frac{\sqrt{48} - \sqrt{80}}{20}$$

Solution: First, separate each of the square roots into two square roots.

$$\frac{\sqrt{}\sqrt{} - \sqrt{}\sqrt{}}{20}$$

Sort out the square roots into perfect squares that go in the **first (red) square root**, and the left-over factors that go in the **second (blue) square root**.

$$\frac{\sqrt{16}\,\sqrt{3} - \sqrt{16}\,\sqrt{5}}{20}$$

Everyone can take the square root of the **first (red) radicals** since they are perfect squares. Nobody knows what to do about the **second (blue) radicals** since they cannot be simplified. So do what you can do **(the red radicals)**, and leave the rest **(blue radicals!)** alone:

$$\frac{4\sqrt{3} - 4\sqrt{5}}{20}$$

Next, factor the numerator, in order to possibly reduce the fraction:

$$\frac{4\left(\sqrt{3} - \sqrt{5}\right)}{20}$$

Finally, reduce the fraction by dividing out the factor of 4:

$$\frac{\sqrt{3} - \sqrt{5}}{5}$$