Rationalizing Denominators

Summary

1. We multiply the numerator and denominator by a radical expression to rationalize denominators.

2. The goal is to get rid of any and all radicals in the denominator.

For the expression $\frac{\sqrt{5}}{\sqrt{2}}$, we can find an equivalent expression that does

not contain a radical in the denominator:

$$\frac{\sqrt{5}}{\sqrt{2}}$$

The above process is called **rationalizing the denominator**.

Example 1. Rationalize each of the following.

(a) $\frac{2}{\sqrt{5}}$

(b) $\frac{2\sqrt{16}}{\sqrt{9x}}$

(c) $\sqrt{\frac{7x}{3y}}$

(d) $\sqrt[3]{\frac{1}{2}}$

How do we go about rationalizing an expression such as $\frac{5}{\sqrt{3}-2}$?

Example 2. Rationalize each of the following.

(a) $\frac{2}{3\sqrt{2}+4}$

(b) $\frac{\sqrt{6}+2}{\sqrt{5}-\sqrt{3}}$