Section 8.5
Multiplying and Dividing Radical Expressions

Multiplying Binomials Involving Radical Expression

You can use the FOIL method.

\[(8 - \sqrt{5})(\sqrt{2} + \sqrt{7})\]
\[= 8\sqrt{2} + 8\sqrt{7} - \sqrt{5}\sqrt{2} - \sqrt{5}\sqrt{7}\]
\[= 8\sqrt{2} + 8\sqrt{7} - \sqrt{10} - \sqrt{35}\]

Multiply and then simplify each product. Assume that all variables represent positive real numbers.

\[\sqrt{5}(\sqrt{125} - 6)\]
Rationalizing a Denominator
A common way of “standardizing” the form of a radical expression is to have the denominator contain no radicals. The process of removing radicals from a denominator so that the denominator contains only rational numbers is called **rationalizing the denominator**.

\[
\frac{12}{\sqrt{6}}
\]
Simplify. Assume that all variables represent positive real numbers.

\[ \frac{\sqrt{7}}{\sqrt{6}} \]

\[ \frac{3\sqrt{2}}{\sqrt{11}} \]

\[ \frac{-8\sqrt{5y}}{\sqrt{y^5}} \]
Rationalize the denominator in each expression. Assume that all variables represent positive real numbers and that no denominators are 0.

\[ \frac{2}{4 + \sqrt{3}} \]
Write each quotient in lowest terms. Assume that all variables represent positive real numbers.

\[
\frac{\sqrt{5} + \sqrt{6}}{\sqrt{3} - \sqrt{2}}
\]

\[
\frac{12 - 6\sqrt{2}}{24}
\]

\[
\frac{11y + \sqrt{242y^3}}{22y}
\]