Multiplying and Dividing Radical Expressions

Multiplication

$$\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$$

1. Simplify each radical expression.

a) $\left(3\sqrt{6}\right)\left(8\sqrt{5}\right)$

b) $\left(-2\sqrt{12}\right)\left(7\sqrt{8}\right)$

c) $\sqrt{48} \cdot \sqrt{3}$

d) $\left(5\sqrt{3}\right)^2$

e) $\sqrt{2}\left(8+\sqrt{12}\right)$

f) $\left(3-\sqrt{6}\right)\left(4+\sqrt{8}\right)$

g) $\left(5+\sqrt{7}\right)\left(5-\sqrt{7}\right)$

Division

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

2. Simplify each radical expression.

a) $\sqrt{\frac{36}{49}}$

b) $\sqrt{\frac{7}{16}}$

3. Rationalize each denominator.

a) $\sqrt{\frac{1}{5}}$

b) $\frac{3+\sqrt{6}}{\sqrt{10}}$

c) $\frac{6-\sqrt{18}}{\sqrt{3}}$

d) $\frac{\sqrt{15}-\sqrt{10}}{\sqrt{5}}$

e) $\frac{3}{3+\sqrt{6}}$

f) $\frac{4+\sqrt{2}}{1+\sqrt{3}}$

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