

Radicals: Multiplying

To multiply radicals, one often uses the distributive property: $a(b + c) = ab + ac$

The product rule $\sqrt[n]{a}\sqrt[n]{b} = \sqrt[n]{ab}$ allows multiplication of radicals with the **SAME** index.

$$(\sqrt{5})(-3\sqrt{6}) = -3\sqrt{30} \quad (2\sqrt{7x})(5\sqrt{7}) = 10\sqrt{49x} = 10 \cdot 7\sqrt{x} = 70\sqrt{x}$$

TRY:

$$3\sqrt{2} \cdot (-4\sqrt{10}) \quad 2\sqrt{5c} \cdot 5\sqrt{5}$$

To multiply a Binomial containing a radical expression by a Monomial
Use the distributive property.

$$\sqrt{3}(5 - \sqrt{2}) = 5\sqrt{3} - \sqrt{6} \quad \text{Be sure to simplify the answer if possible.}$$

TRY:

$$7(2 - 3\sqrt{6}) \quad -2\sqrt{5}(\sqrt{3} + 3\sqrt{5}) \quad \sqrt{3ab}(\sqrt{3a} + \sqrt{3})$$

To multiply a Binomial containing a radical expression by a Binomial
Use FOIL.

$$(\sqrt{3} + 2\sqrt{5})(4 - \sqrt{2}) = 4\sqrt{3} - \sqrt{6} + 8\sqrt{5} - 2\sqrt{10}$$

TRY:

$$(2\sqrt{6} - 3)(2\sqrt{6} + 4) \quad (3\sqrt{2} - \sqrt{3})(2\sqrt{2} + 3\sqrt{3}) \quad (5a + \sqrt{ab})^2$$