

TOPIC: IRRATIONAL NUMBERS

Product Rule of Radicals

◆ Square roots can be simplified using the **Product Rule** (Multiplication Rule).

New

Product Rule for Square Roots

$$\sqrt{9} \cdot \sqrt{4} \qquad \sqrt{9 \cdot 4}$$

$$\sqrt{a} \cdot \sqrt{b} \qquad \sqrt{a \cdot b}$$

◆ Use in both directions: _____ the product of 2 radicals into 1 **OR** _____ 1 radical to the product of 2.

EXAMPLE

Use the product property to simplify each radical expression.

(A) $\sqrt{3} \cdot \sqrt{11}$

(B) $\sqrt{2} \cdot \sqrt{8}$

(C) $\sqrt{50}$

Hint: Rewrite 50 as a product so that one of its factors is a perfect square.

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EXAMPLE

Use the product property to simplify the radical expression.

$$\sqrt[3]{4} \cdot \sqrt[3]{2}$$

PRACTICE

Use the product rule to multiply the following.

(A) $\sqrt{6} \cdot \sqrt{5}$

(B) $\sqrt{5x} \cdot \sqrt{7y}$

PRACTICE

Use the product rule to multiply the following.

(A) $\sqrt[4]{7m^2} \cdot \sqrt[4]{2n}$

(B) $\sqrt{8} \cdot \sqrt[3]{2}$

PRACTICE

Use the product rule to rewrite the term inside the radical as a product, then simplify.

(A) $\sqrt{180}$

(B) $-\sqrt{72x^2}$