TOPIC: DIVIDING SQUARE ROOTS

Quotient Rule of Radicals

◆ Like the product rule, you can use the **quotient rule** to simplify radicals.

New **Quotient Rule for Square Roots**

$$\sqrt{\frac{64}{4}} \qquad \frac{\sqrt{64}}{\sqrt{4}}$$

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

◆ Use in both directions: To *split* 1 radical to the quotient of 2 **OR** *condense* the quotient of 2 radicals into 1.

EXAMPLE Use the quotient property to simplify each radical expression.

(A) $\sqrt{\frac{144}{25}}$

(B) $\sqrt{\frac{9}{49}}$

(C) $\frac{\sqrt{300}}{\sqrt{3}}$

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EXAMPLE Use the quotient rule to simplify the radical expression.

$$\sqrt[3]{\frac{64}{343}}$$

PRACTICE Use the quotient rule to simplify.

(***A***) $\sqrt{\frac{2}{81}}$

(***B***) $\sqrt{\frac{x^2}{36}}$

PRACTICE Use the quotient rule to simplify.

$$\sqrt[3]{\frac{t}{8}}$$

PRACTICE Use the quotient rule to divide, then simplify.

(***A***) $\frac{\sqrt{75}}{\sqrt{3}}$

(***B***) $\frac{\sqrt{144}}{\sqrt{16}}$

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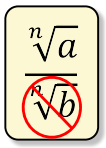
Rationalizing Denominators



◆ Radicals CANNOT be left in the BOTTOM of a fraction. This is **BAD!**

► If you can't simplify the $\sqrt{\ }$ to perf. square, you must *make* it a perf. square by **Rationalizing the Denominator:**

► Multiply _____ & _____ by *something* (usually bottom $\sqrt{\ }$)

Radical simplifies to perfect square

$$\frac{\sqrt{2}}{\sqrt{8}} = \sqrt{\frac{2}{8}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$$

Rationalizing Denominator

EXAMPLE: Rationalize the denominator.

$$\frac{1}{\sqrt{3}} \cdot \left(-\right)$$

Caution!

Multiplying *only* the bottom is wrong!

PRACTICE Rationalize the denominator.

(A) $-\frac{5}{2\sqrt{7}}$

(B) $\frac{6+\sqrt{x}}{-\sqrt{x}}$