Warm-ups from 5.1/5.2

Tuesday, February 11, 2020 11:36 AM

① Solve: $x^4 = 81$

$x = \pm\sqrt[4]{81}$

$x = \pm 3$

$x^3 = -64$

$x = \sqrt[3]{-64}$

$x = -4$

② Simplify: $\sqrt{4200}$ $(a, b \geq 0)$

4200

$42 \quad 100$

$2 \cdot 21 \quad 2 \cdot 50$

$3 \cdot 7 \quad 2 \cdot 25$

$5 \cdot 5$

$= \sqrt{2^3 \cdot 3 \cdot 7 \cdot 5^2}$

$= 2 \cdot 5\sqrt{2 \cdot 3 \cdot 7}$

$= 10\sqrt{42}$

$\sqrt[3]{\frac{162a^2}{b^4}}$

$= \frac{\sqrt[3]{3^4 \cdot 2} \cdot \sqrt[3]{a^2}}{\sqrt[3]{b^4}} = \frac{3\sqrt[3]{6} \cdot \sqrt[3]{a^2}}{\sqrt[3]{b^3 \cdot b}}$

162

$2 \cdot 81$

$9 \cdot 9$

$3 \cdot 3 \cdot 3 \cdot 3$

$= \frac{3\sqrt[3]{6} \cdot \sqrt[3]{a^2}}{b\sqrt[3]{b}}$

$= \frac{3}{b}\sqrt[3]{\frac{6a^2}{b}}$

$\frac{\sqrt[3]{32a^3b^4}}{\sqrt[3]{2ab^7}} = \sqrt[3]{\frac{32a^3b^4}{2ab^7}}$

$= \frac{\sqrt[3]{2^5 a^3 b^4}}{\sqrt[3]{2ab^7}}$

32

$4 \quad 8$

$2 \cdot 2 \quad 2 \cdot 4$

$2 \cdot 2$

$= \frac{2ab\sqrt[3]{2^2 \cdot b}}{b^2\sqrt[3]{2 \cdot ab}}$

$= \frac{2a}{b}\sqrt[3]{\frac{2^2 \cdot b}{2ab}}$

$= \frac{2a}{b}\sqrt[3]{\frac{2}{a}} = \frac{2}{b}\sqrt[3]{2a^2}$

(3) Convert to Entire radical: $-\frac{x^3}{8}\sqrt[3]{y^2}$

$$= \sqrt[3]{y^2 \cdot \left(-\frac{x^3}{8}\right)^3}$$

$$= \sqrt[3]{\frac{-y^2x^9}{512}}$$

(4) Explain why $\sqrt{x^4y^2} = x^2 \cdot |y|$, needs an absolute value on y but not X

$\sqrt{y^2} = |y| \rightarrow y = -2 \Rightarrow \sqrt{(-2)^2} = \sqrt{4} = 2$

(5.1) 4,5

$$\sqrt{x^4} = \sqrt{x^2} \cdot \sqrt{x^2} = |x| \cdot |x| = |x|^2 = x^2$$

$|y| \neq y$

But $|x|^2 = x^2$