

September 28, 2016

Review Questions

Note

$$\begin{matrix} & & \frac{1}{2} & & \frac{1}{2} \\ (x^6) & & & & (y^4) \\ x^{6(\frac{1}{2})} & & & & y^{4(\frac{1}{2})} \\ & & x^3 & & y^2 \end{matrix}$$

A Simplified radical has the fewest and smallest terms inside the radical symbol.

$$\sqrt{20}$$

: reduce the number in the radical

$$= \sqrt{4.5}$$

$$= \sqrt{4} \cdot \sqrt{5}$$

$$= \underline{\underline{2\sqrt{5}}}$$

Ex:

$$\begin{aligned}\sqrt[3]{24} &= \sqrt[3]{8 \cdot 3} \\ &= \sqrt[3]{8} \cdot \sqrt[3]{3} \\ &= \underline{\underline{2\sqrt[3]{3}}}\end{aligned}$$

Ex: $\sqrt{180x^6y^3}$

$$= \sqrt{(36)(5)x^6y^2 \cdot y}$$
$$= \sqrt{36} \sqrt{x^6} \sqrt{y^2} \sqrt{5y}$$
$$= 6x^3y\sqrt{5y}$$

$$= \underline{\underline{6x^3y\sqrt{5y}}}$$

$$\begin{aligned} \underline{\text{ex:}} \quad \sqrt[3]{\frac{x^{12}}{64}} &= \frac{\sqrt[3]{x^{12}}}{\sqrt[3]{64}} \\ &= \frac{x^{\frac{12}{3}}}{4} \\ &= \underline{\underline{\frac{x^4}{4}}} \end{aligned}$$

backwards : write as a complete radical

$$\begin{aligned} 3\sqrt{5} \\ &= \sqrt{9}\sqrt{5} \\ &= \sqrt{9 \cdot 5} \\ &= \underline{\underline{\sqrt{45}}} \end{aligned}$$

$$3 = \sqrt{9}$$

- because 9 and 5 are both under the same degree of radical

$$\begin{aligned} \underline{\text{ex:}} \quad & -\frac{4}{x^2} \sqrt{5x^3} \\ & -\sqrt{16} \sqrt{x^4} \sqrt{5x^3} \\ & -\sqrt{16 \cdot x^4 \cdot 5 \cdot x^3} \\ & -\sqrt{80x^7} \end{aligned}$$

$$4 = \sqrt{16}$$

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

$$-1 = \sqrt{\quad}$$

not possible with real numbers

↑ The minus sign can not be put into an even

radical sign.

Ex: $-\frac{3x^2y}{5} \sqrt[3]{2xy^2}$

$$\sqrt[3]{\frac{-27 \cdot x^6 \cdot y^3 \cdot 2 \cdot x \cdot y^2}{125}}$$

$$\sqrt[3]{\frac{-54x^7y^5}{125}}$$

$$-3 = \sqrt[3]{-27}$$

$$x^2 = \sqrt[3]{x^6}$$

$$y = \sqrt[3]{y^3}$$

$$5 = \sqrt[3]{125}$$

work on ch. 1.3

$$\sqrt{x^2 - y^2} = \cancel{\sqrt{x^2} - \sqrt{y^2}}$$

Not allowed

$$= \sqrt{(x-y)(x+y)}$$

$$\sqrt{x^2 + y^2} \neq \sqrt{(x+y)^2} \neq x+y$$

wrong

$$\underline{\underline{x^2 + y^2 \neq (x+y)^2}}$$

$x^2 + y^2$ does not factor
 $(x+y)(x+y) = x^2 + 2xy + y^2$

$$\sqrt{\frac{8}{9}}$$

$$\sqrt{\frac{7}{8}}$$

$$\sqrt{\frac{8}{9} \cdot \frac{8}{8}}$$

$$\sqrt{\frac{7}{8} \cdot \frac{9}{9}}$$

$$\sqrt{\frac{64}{72}}$$

$$\sqrt{\frac{63}{72}}$$

$$\frac{9x^2}{3x^5} \cdot \frac{\sqrt{x^2y^5}}{\sqrt{x^6y}}$$

$$= \frac{9x^2 \sqrt{x^2} \sqrt{y^4 \cdot y}}{3x^5 \sqrt{x^6} \sqrt{y}}$$

$$= 3 \frac{1x^{\cancel{2}} \cdot x^{\cancel{2}} y^2 \sqrt{y}}{3x^{\cancel{5}} \sqrt{y}}$$

$$= \frac{3y^2}{3} ; y \neq 0$$