

Simplifying square roots...let's practice!!

$$\begin{aligned} &\sqrt{12} \\ &\sqrt{4 \times 3} \\ &\sqrt{4} \cdot \sqrt{3} \\ &2\sqrt{3} \end{aligned}$$

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

$$\begin{aligned} &9\sqrt{8} \\ &9(\sqrt{4} \cdot \sqrt{2}) \\ &9(2\sqrt{2}) \\ &18\sqrt{2} \end{aligned}$$

4	81
9	100
16	121
25	144
36	
49	
64	

$$\begin{aligned} &5\sqrt{90} \\ &5(\sqrt{9} \cdot \sqrt{10}) \\ &5(3\sqrt{10}) \\ &15\sqrt{10} \end{aligned}$$

$$\begin{aligned} &\sqrt{72} \\ &(\sqrt{36} \cdot \sqrt{2}) \\ &6\sqrt{2} \\ &\underline{02} \\ &\sqrt{9} \cdot \sqrt{8} \\ &3\sqrt{8} \\ &3(\sqrt{4} \cdot \sqrt{2}) \\ &3(2\sqrt{2}) \\ &6\sqrt{2} \end{aligned}$$

$$\begin{aligned} &7\sqrt{48} \\ &7(\sqrt{16} \cdot \sqrt{3}) \\ &7(4\sqrt{3}) \\ &28\sqrt{3} \end{aligned}$$

\*Reducing to Mixed Radicals

\*Switching Mixed Radical to Entire Radical

$$\begin{array}{ccc} 2\sqrt{5} & \Rightarrow & \sqrt{20} \\ \text{Mixed} & & \sqrt{4 \cdot 5} \\ \text{Radical} & & 2\sqrt{5} \end{array}$$

$$3\sqrt{2} \Rightarrow \sqrt{3^2 \cdot 2} = \sqrt{18}$$

$$4\sqrt{3} \Rightarrow \sqrt{4^2 \cdot 3} = \sqrt{48}$$

Arrange in order, least to greatest

$$5\sqrt{2}, 3\sqrt{5}, \sqrt{15}, 3\sqrt{3}$$

$$\begin{array}{ccc|c} \sqrt{5^2 \cdot 2} & \left\{ \begin{array}{l} \sqrt{3^2 \cdot 5} \\ \sqrt{45} \end{array} \right\} & \sqrt{15} & \left| \begin{array}{l} \sqrt{3^2 \cdot 3} \\ \sqrt{27} \end{array} \right. \\ \sqrt{50} & & & \end{array}$$

$$\sqrt{15}, 3\sqrt{3}, 3\sqrt{5}, 5\sqrt{2}$$

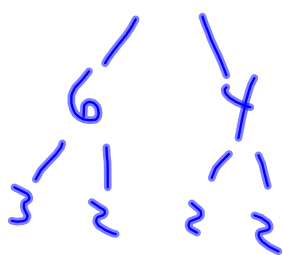
What about simplifying roots OTHER than square roots?

$$\sqrt[3]{24}$$

$$\sqrt[3]{8} \cdot \sqrt[3]{3}$$

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

$$24$$



$$3 \cdot 2^3$$

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

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

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

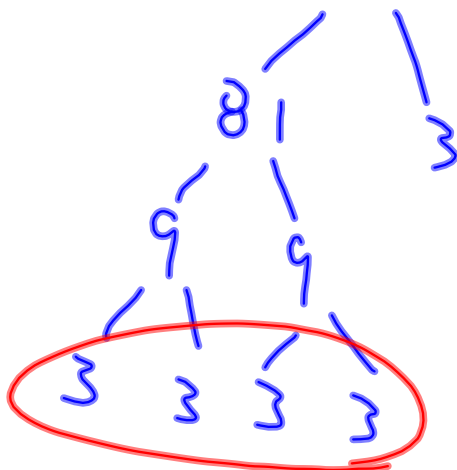
$$3^4 = 81$$

$$\sqrt[4]{243}$$

$$\sqrt[4]{81} \cdot \sqrt[4]{3}$$

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

$$243$$



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

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

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

Mixed

Entire

$$3\sqrt[3]{5} \Rightarrow \sqrt[3]{3^3 \cdot 5} = \sqrt[3]{135}$$

$$2\sqrt[4]{3} \Rightarrow \sqrt[4]{2^4 \cdot 3} = \sqrt[4]{48}$$

$$-3\sqrt[6]{2} \Rightarrow -\sqrt[6]{3^6 \cdot 2} = -\sqrt[6]{1458}$$

$$-3\sqrt[5]{2} = -\sqrt[5]{486}$$

Simplify each radical.

a)  $\sqrt{80}$   
 $\sqrt{16} \cdot \sqrt{5}$   
 $4\sqrt{5}$

b)  $\sqrt[3]{144}$   
 $\sqrt[3]{8} \cdot \sqrt[3]{18}$   
 $2\sqrt[3]{18}$

c)  $\sqrt[4]{162}$   
 $2^4 = 16$   
 $3^4 = 81$   
 $\sqrt[4]{81} \cdot \sqrt[4]{2}$   
 $3\sqrt[4]{2}$

Practice Problems...

Pg. 218/219

# 5, 11, 12, 17, 18, 20, 21, 22