

Notes - Simplifying Radicals

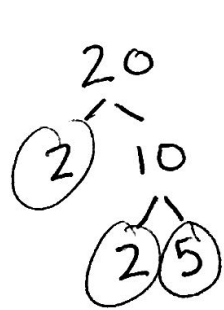
Remember: radicals undo exponents $\sqrt{x^2} = x$ $\sqrt{4} = \sqrt{2^2} = 2$
 $\sqrt[3]{x^3} = x$ $\sqrt[3]{8} = \sqrt[3]{2^3} = 2$

Properties: $\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$
 Ex: $\sqrt{8} = \sqrt{4 \cdot 2} = \sqrt{4} \sqrt{2}$
 $2\sqrt{2}$

$\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$
 Ex: $\sqrt{8} \neq \sqrt{6+2}$
 Oah! No! ;)

To simplify roots you can use factor trees or find the perfect squares (or cubes)

Ex 1: Simplify $\sqrt{20}$

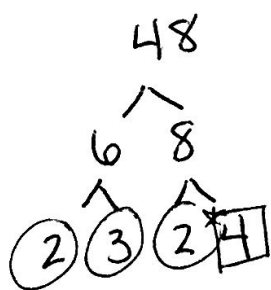


$\sqrt{2^2 \cdot 5}$
 $\sqrt{2^2} \sqrt{5}$
 $2\sqrt{5}$



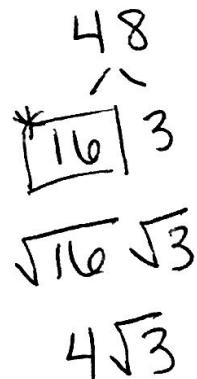
$\sqrt{4 \cdot 5}$
 $\sqrt{4} \sqrt{5}$
 $2\sqrt{5}$

Ex 2: $\sqrt{48}$



$\sqrt{2^2 \cdot 3 \cdot 4}$
 $\sqrt{2^2} \sqrt{3} \sqrt{4}$
 $2 \cdot \sqrt{3} \cdot 2$

$4\sqrt{3}$



$$\text{Ex 3: } \sqrt{10}$$

$$\begin{array}{c} 10 \\ \wedge \\ 2 \ 5 \end{array}$$

When there are no factors that are squared (or more), you're done

$$\text{Ex 4: } \sqrt{c^5} = \sqrt{c^2 c^2 c}$$

$$= \sqrt{c^2} \sqrt{c^2} \sqrt{c}$$

$$c \cdot c \sqrt{c} = c^2 \sqrt{c}$$

$$\text{Ex 5: } 4\sqrt{75p^3}$$

$$\boxed{25}^3 \quad \boxed{p^2}^3$$

$$= 4\sqrt{25}^3 \sqrt{3} \sqrt{p^2}^3 \sqrt{p}$$

$$4 \cdot 5 p \sqrt{3 \cdot p}$$

$$\textcircled{20p \sqrt{3p}}$$