

$$1^2 = 1$$

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$7^2 = 49$$

$$8^2 = 64$$

$$9^2 = 81$$

$$10^2 = 100$$

$$11^2 = 121$$

$$12^2 = 144$$

$$13^2 = 169$$

$$14^2 = 196$$

$$15^2 = 225$$

1. Factor Tree - twins leave  
Single stays

2. Rewrite with the  
product of the largest  
perfect square.

Ex 1       $\sqrt{300}$        $10\sqrt{3}$

$$\sqrt{300} = \sqrt{3} \cdot \sqrt{100} = 10\sqrt{3}$$

Ex 2       $\sqrt{99}$        $3\sqrt{11}$

$\sqrt{11} \cdot \sqrt{9}$

Ex 3       $\sqrt{162}$        $9\sqrt{2}$

Ex       $\sqrt{18x^2y^3}$        $3xy\sqrt{2y}$

## Add / Sub.

1. Simplify each term
2. You can add like radicands (# under the radical)

Ex 4      $\underline{3}\sqrt{6} + \underline{8}\sqrt{6}$       $\frac{3a+8a}{11a}$   
 $\quad\quad\quad 11\sqrt{6}$

Ex 5      $\textcircled{2}\sqrt{7} + 9\sqrt{3} - \textcircled{8}\sqrt{7}$   
 $\quad\quad\quad -6\sqrt{7} + 9\sqrt{3}$

Ex 6      $5\sqrt{3} - \sqrt{27}$   
 $\quad\quad\quad \quad\quad\quad 9\sqrt{3}$   
 $\quad\quad\quad \quad\quad\quad \textcircled{33}$   
 $\quad\quad\quad 5\sqrt{3} - 3\sqrt{3}$   
 $\quad\quad\quad 2\sqrt{3}$

# Multiply

1. Multiply the radicands
2. Multiply the coefficients
3. Simplify

Ex 7  $\sqrt{5} \cdot \sqrt{20}$   
 $\sqrt{100}$   
 10

Ex 8  $\sqrt{8} \cdot 7\sqrt{8}$   
 $7\sqrt{64}$   
 $7 \cdot 8 = 56$

Ex 9  $7\sqrt{2} \cdot 3\sqrt{18}$   
 $21\sqrt{36}$   
 $21 \cdot 6 = 126$

Ex  $8\sqrt{3} (2\sqrt{3} + \sqrt{8})$

$16\sqrt{9} + 8\sqrt{24}$   
 $16 \cdot 3$   
 $48 + 2\sqrt{6}$   
 $8 \cdot 3$   
 $2 \cdot 4$   
 $22$

~~$2\sqrt{12} = 48$~~