## **PRINCIPLES - LESSON 14C MULTIPLYING RADICALS**

#### Simplify.

ex1)  $5 \cdot \sqrt{3} = 5 \sqrt{3}$ 



# ex2) $5 \cdot \sqrt{4} = 5 \cdot 2$ ex3) $\sqrt{5} \cdot \sqrt{4} = \sqrt{5} \cdot 2$

### **THE GROUND RULES**

#### **Ground Rule #1:**

"Inside with Inside -**Outside with Outside**"



When multiplying radicals, multiply numbers inside a radical only by other numbers inside a radical. Multiply numbers outside a radical only by other numbers outside a radical.

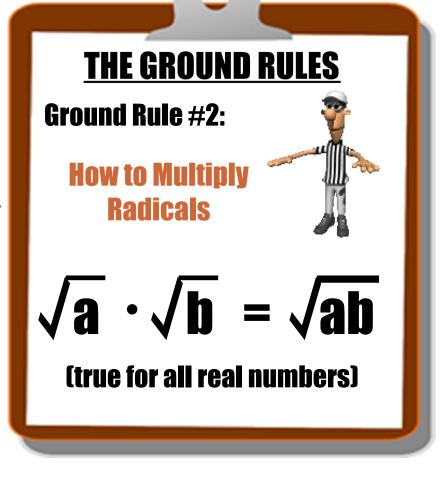
### MULTIPLYING RADICALS

Simplify.

ex4)  $\sqrt{8} \cdot \sqrt{2}$  THE EASY WAY =  $\sqrt{8} \cdot 2 = \sqrt{6} = 4$ 

ex5)  $\sqrt{8} \cdot \sqrt{2}$  The hard way

=24=2.2=4





Simplify.

ex6) 
$$\sqrt{2n^5} \cdot \sqrt{6n}$$

$$= \sqrt{2n^5} \cdot 6n$$

$$=\sqrt{12n^6}$$

$$= \sqrt{4 \cdot 3 \cdot n^6}$$



ex7)  $3\sqrt{5xy} \cdot 2\sqrt{4xy^4}$ =  $3 \cdot 2 \cdot \sqrt{5xy} \cdot 4xy^4$  $= 6\sqrt{4\cdot5\cdot x^{2}\cdot y^{4}\cdot y}$  $= 12xy^{2}\sqrt{5y}$ 



#### Simplify.

 $\leq$ 

ex8) 
$$5\sqrt[3]{9x^2} \cdot 2\sqrt[3]{-3x^5}$$

Now we need perfect cubes!

 $= 10^{3} - 27 \chi^{7}$ 

$$= 10 \sqrt[3]{-27 \cdot \chi^{6} \cdot \chi}$$

$$-30 \chi^2 \sqrt[3]{\chi}$$



### Simplify. ex9) $\sqrt{3}(\sqrt{3}+5)$

### = 19 + 513





Simplify. ex10)  $(2\sqrt{5}+4)(4\sqrt{5}-7)$ 

 $= 8\sqrt{25} - 14\sqrt{5} + 16\sqrt{5} - 28$ 

 $= 40 + 2\sqrt{5} - 28$ 

= 12 + 25

### MULTIPLYING RADICALS

Simplify.

$$= (-65w)(-65w)$$

 $= 36 \sqrt{w^{a}}$ 

ex11)  $(-6\sqrt{W})^2$ 



$$foilex121 (1-6\sqrt{w})^{2}$$
  
= (1-65w)(1-65w)  
= 1-65w - 65w + 365w^{2}  
= 1-125w + 36w