Sec1H	Notes 6-1	Unit 6
	Operations with Radicals	

## **Example 1: Estimate Value of Radicals**

$$\sqrt{1} = 1$$
 $\sqrt{36} = 6$ 
 $\sqrt{121} = 1$ 
 $\sqrt{4} = 2$ 
 $\sqrt{49} = 7$ 
 $\sqrt{144} = 12$ 
 $\sqrt{9} = 3$ 
 $\sqrt{64} = 8$ 
 $\sqrt{169} = 13$ 
 $\sqrt{16} = 4$ 
 $\sqrt{81} = 9$ 
 $\sqrt{196} = 14$ 
 $\sqrt{25} = 5$ 
 $\sqrt{100} = 10$ 
 $\sqrt{225} = 15$ 

Using the above information estimate the value of each radical. Do not use a calculator.

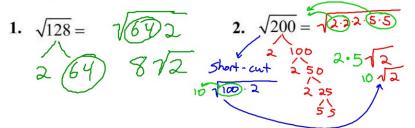
1. 
$$\sqrt{34} =$$
  $2.$   $\sqrt{200} =$   $2.$   $2.$   $2.$ 

3. 
$$\sqrt{119} =$$
 4.  $8\sqrt{7} =$ 

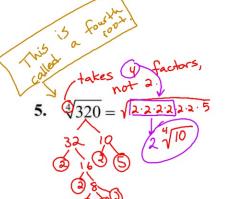
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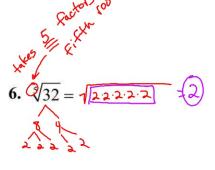
## **Example 2: Simplifying Radicals**

Simplify each radical. Show your work.



3. 
$$\sqrt{850} =$$
 4.  $\sqrt[3]{8} =$ 





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Notes 6-1 **Operations with Radicals** 

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**Example 3: Add & Subtract Radicals:** (It's really collecting like terms.)

Add or subtract. Make sure all radicals are simplified.

1. 
$$(3\sqrt{5}) + 8 + (7\sqrt{5}) = 10\sqrt{5} + 8$$

1. 
$$(3\sqrt{5}+8+7\sqrt{5})=10\sqrt{5}+8$$
2.  $4\sqrt{12}-8\sqrt{3}=$ 
 $(4\sqrt{12}-8\sqrt{3})$ 
 $(4\sqrt{2}-3\sqrt{3})$ 
 $(4\sqrt{2}-3\sqrt{3})$ 
 $(4\sqrt{2}-3\sqrt{3})$ 
 $(4\sqrt{2}-3\sqrt{3})$ 
 $(4\sqrt{2}-3\sqrt{3})$ 

3. 
$$\sqrt{75} + \sqrt{108} =$$

$$5 | 5 | 3 | 36$$

$$5 | 3 | 3 | 4$$

$$5 | 3 | 3 | 4$$

$$6 | 3 | 2 | 3$$

4. 
$$\sqrt{8} - \sqrt{27} =$$
 $(3.3) \cdot 3$ 
 $(3.3) \cdot$ 

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**Example 4: Multiply Radicals:** 

Multiply. Make sure all radicals are simplified.

1. 
$$3\sqrt{5} \cdot 7\sqrt{5} =$$

$$3 \cdot 7 \cdot \sqrt{5 \cdot 5}$$
at  $\sqrt{25}$ 
21.5 = 105

2. 
$$5\sqrt{7} \cdot 4\sqrt{3} = 5 \cdot 4\sqrt{7} \cdot 3$$

3. 
$$\left(\sqrt{17}\right)^2 = \sqrt{17 \cdot \sqrt{17}}$$

$$= \sqrt{17 \cdot \sqrt{17}}$$

$$= \sqrt{17 \cdot \sqrt{17}}$$

3. 
$$(\sqrt{17})^2 = \sqrt{17} \cdot \sqrt{17}$$
4.  $(7\sqrt{3})^2 = 7\sqrt{3} \cdot 7\sqrt{3}$ 

$$7 \cdot 7\sqrt{3} \cdot 3$$

$$49 \cdot 3$$

$$(147)$$