Honors Math II Unit 1.3 simplifying, adding & subtracting radicals Name\_\_\_\_\_ Date\_\_\_\_\_Period\_\_\_\_\_

# Parts of a Radical



For each radical, determine the index number and radicand.

 $\sqrt{24}$   $\sqrt[3]{27}$ 

 $\sqrt[4]{16xy}$   $\sqrt{128n^8}$ 

Write all the factor pairs for the given number, then circle the pairs that contain a perfect square.

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<u>24</u>	<u>48</u>	<u>20</u>	<u>80</u>	
1•24				
2•12				
3•8				
4•6				

In order to simplify square roots we must look for factors that are perfect squares. <u>For example:</u> there are many ways to multiply two numbers to make 80. We are only interested in the pair that contains a perfect square.



Alternate method is prime factorization.
$\sqrt{80}$

Simplify: (no calculator)

$\sqrt{20}$	$\sqrt{24}$	$\sqrt{25}$ $\sqrt{32}$	$\sqrt{165}$
<b>Simplifying radicals</b> Give an exact answer a	nd an approximate an	swer.	
$\sqrt{12}$	$\sqrt{18}$	$\sqrt{48}$	$\sqrt{128}$
Exact answer:	Exact answer:	Exact answer:	Exact answer:
Approximate:	Approximate:	Approximate:	Approximate:
How do you simplify a	radical if it is not a squ	are root?	
<sup>3</sup> √32		<sup>3</sup> √56	<sup>4</sup> √32

Simplify the following radicals. Leave answer in reduced radical form.

$\sqrt{48}$	$\sqrt{54}$
<sup>3</sup> √48	3√54

#### What happens when there is a number out in front of the radical?

$3\sqrt{8}$ $\sqrt{12}$ $5\sqrt{24}$ $4\sqrt{24}$	$3\sqrt{8}$	$7\sqrt{12}$	$5\sqrt{24}$	$4\sqrt[3]{24}$
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#### Practice:

$\sqrt{105}$ $2\sqrt{96}$ $\sqrt[3]{64}$	³√128
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What happens when you have variables? Any patterns?

$\sqrt{x^2}$	$\sqrt[3]{x^2}$
$\sqrt{x^3}$	$\sqrt[3]{x^3}$
$\sqrt{x^8}$	$\sqrt[3]{x^8}$
$\sqrt{x^{10}}$	$\sqrt[3]{\chi^{10}}$

#### Quick Check:

$\sqrt{22 \cdot 2 \cdot 3}$	$3\sqrt{(1-8)}6$
$\sqrt{32\chi^2 \gamma^3}$	$\sqrt{64x^{6}y^{6}}$
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# Adding or Subtracting radicals

 $4\sqrt{3} + 2\sqrt{3} =$ 

 $4\sqrt{7} - 6\sqrt{7} =$ 

 $\sqrt{24} + \sqrt{54} =$ 

#### $4\sqrt{24} + 3\sqrt{54} =$

# Simplify:

 $5\sqrt[3]{2} - \sqrt[3]{16} = 2\sqrt{3} + 5\sqrt[3]{3} =$ 

# $2\sqrt{3x} + \sqrt{3x} = \sqrt{12w} - \sqrt{27w}$