Welcome Back MYP Math 9!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 12/11 Topic: Unit 3 test Friday - no HW!	0 1 2	
Tuesday Date: 12/12 Topic: 5AB Simplifying Radicals	0 1 2	
Wednesday Date: 12/13 Topic: Day 2 5AB Simplifying Radicals	0 1 2	
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up:

C **SIMPLEST RADICAL FORM**

1. $\left(2\sqrt{3}\right)^2 = (2\sqrt{3})(2\sqrt{3}) = 4 \cdot 3 = 12$

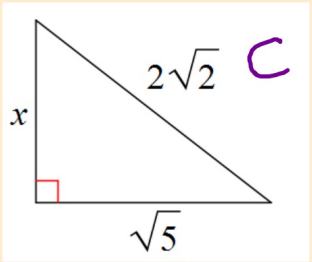
2. $\left(-2\sqrt{3}\right)\left(-4\sqrt{3}\right) = 8\sqrt{3}\cdot\sqrt{3} = 8 \cdot 3 = \boxed{24}$

3. $\sqrt{4\sqrt{5}} = \sqrt{20} = \sqrt{4 \cdot 5} = \sqrt{4}\sqrt{5} = \boxed{2\sqrt{5}}$

C **SIMPLEST RADICAL FORM**

Warm-up:

Solve for the length of x.



$a^2+b^2=c^2$

c

$x^2+(\sqrt{5})^2=(2\sqrt{2})^2$

$x^2+5=8$

$-5 \quad -5$

$x^2=3$

$x=\sqrt{3}$

$(2\sqrt{2})^2=4\cdot 2=8$

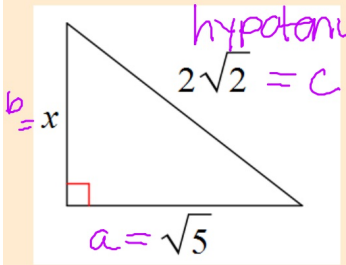
$(2\sqrt{2})(2\sqrt{2})$

. . .

C **SIMPLEST RADICAL FORM**

Warm-up:

Solve for the length of x.



hypotenuse $2\sqrt{2} = c$

$a = \sqrt{5}$

$b = x$

$a^2 + b^2 = c^2$

$(2\sqrt{2})^2$ $(2\sqrt{2})(2\sqrt{2})$

$2^2(\sqrt{2})^2$ $2 \cdot 2 \cdot \sqrt{2} \cdot \sqrt{2}$

$4 \cdot 2$ $4 \cdot 2$

$\boxed{8}$

$(\sqrt{5})^2 + x^2 = (2\sqrt{2})^2$

$5 + x^2 = 8$

$-5 \quad -5$

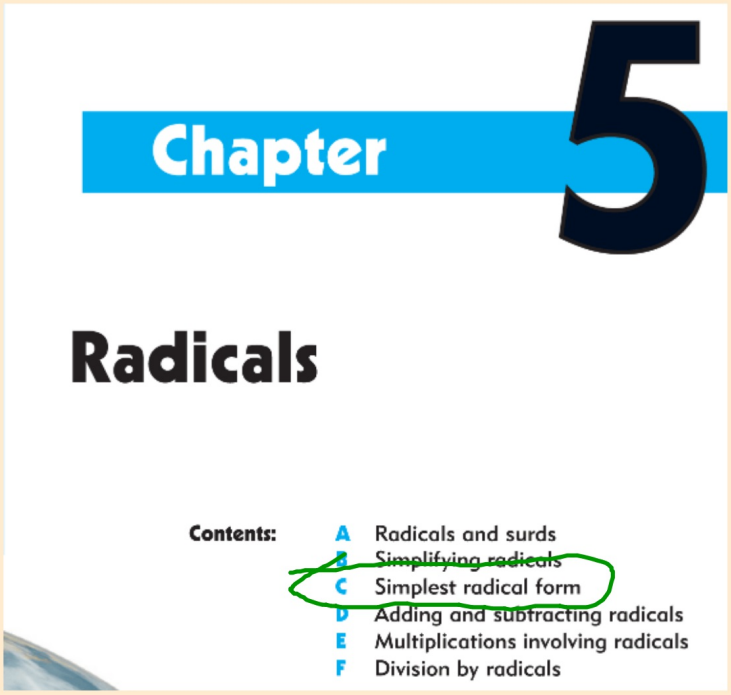
$\sqrt{x^2} = \sqrt{3}$

$\boxed{x = \sqrt{3}}$

Class Plan:

1. Warm-up
2. C SIMPLEST RADICAL FORM
3. Examples
4. Practice

Unit 4: Radicals, Radians, and Unit Circle



Chapter 5

Radicals

Contents:

C SIMPLEST RADICAL FORM

Question for today...

How can we make these radicals simpler?

$\sqrt{8}$ $\sqrt{50}$ $\sqrt{125}$ $\sqrt{128}$ $\sqrt{200}$

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

C **SIMPLEST RADICAL FORM**

Simplest Radical Form:

Number under $\sqrt{}$ is the smallest possible integer.

To get into **simplest form**:

1) Factor out perfect squares.

Perfect Squares

These are from your times tables... So, you should already know them. (If you don't, then break out those flash cards and get to it!)

$1^2 = 1$	$5^2 = 25$	$9^2 = 81$
$2^2 = 4$	$6^2 = 36$	$10^2 = 100$
$3^2 = 9$	$7^2 = 49$	$11^2 = 121$
$4^2 = 16$	$8^2 = 64$	$12^2 = 144$

Square Roots

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

To get radical in **simplest form**:

1) Factor out perfect squares.

Perfect Squares

These are from your times tables... So, you should already know them. (If you don't, then break out those flash cards and get to it!)

$1^2 = 1$	$5^2 = 25$	$9^2 = 81$
$2^2 = 4$	$6^2 = 36$	$10^2 = 100$
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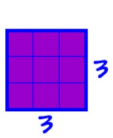
$4^2 = 16$	$8^2 = 64$	$12^2 = 144$

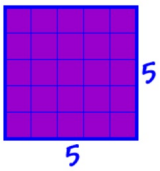
Why are they called "perfect squares" (or just "squares")?

Because they are the area of a square!



area:

$3^2 = 9$



area:

$5^2 = 25$

http://www.coolmath.com/prealgebra/04-exponents/02-exponents-important-common-01

Why do we simplify radicals?

- explore geometric patterns (special rights)
(what we will do tomorrow!)

- better values to work with

Challenge!: Using the digits 0-9 at most one time each, make both of these equations true

$\sqrt{\square\square} = \square\sqrt{\square}$

$\sqrt{\square\square} = \square$

$\sqrt{54}$

$\sqrt{9.6}$

$\sqrt{54} = 3\sqrt{6}$

$\sqrt{81} = 9$

How many possibilities are there?

Example 7 **Self Tutor**

Write $\sqrt{8}$ in simplest form.

$\sqrt{8} = \sqrt{4 \cdot 2}$

$\sqrt{8} = \sqrt{4}\sqrt{2}$

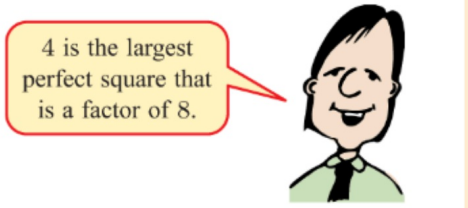
$= 2\sqrt{2}$

Square Roots

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

$\sqrt{200} = \sqrt{100 \cdot 2}$

$= 10\sqrt{2}$



To Simplify a Radical:

1) Factor out perfect squares.

Example: Write in simplest form.

$$\sqrt{75}$$

$\sqrt{25 \cdot 3}$

$\sqrt{25} \cdot \sqrt{3}$

$5\sqrt{3}$

Square Roots

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

To Simplify a Radical:

1) Factor out perfect squares.

Exercises... Textbook handout (5C)

Use grid to keep organized (problem per square)

a-p

a	b $\sqrt{28}$ $\sqrt{4 \cdot 7}$ $2\sqrt{7}$	c	d
e	f	g	h
i	j	k	l
m	n	o	p

C SIMPLEST RADICAL FORM

A radical is in **simplest form** when the number under the radical sign is the smallest possible integer.

Example: Write in simplest form.

(1b) $\sqrt{28} = \sqrt{4 \cdot 7} = 2\sqrt{7}$

Square Roots

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

C SIMPLEST RADICAL FORM

A radical is in **simplest form** when the number under the radical sign is the smallest possible integer.

Example: Write in simplest form.

(1h) $\sqrt{63}$

Square Roots

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

C SIMPLEST RADICAL FORM

A radical is in **simplest form** when the number under the radical sign is the smallest possible integer.

Example: Write in simplest form.

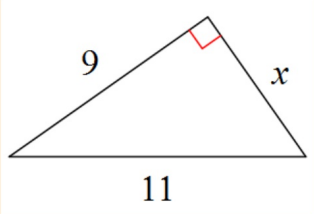
(1j) $\sqrt{125}$

Square Roots

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

C SIMPLEST RADICAL FORM

Example: Solve for x and keep solution in simplest form.



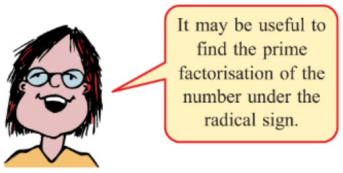
C SIMPLEST RADICAL FORM

In textbook...

Example 8 Self Tutor

Write $\sqrt{432}$ in simplest radical form.

$$\begin{aligned}
&\sqrt{432} \\
&= \sqrt{2^4 \times 3^3} \\
&= \sqrt{2^4} \times \sqrt{3^3} \\
&= 4 \times 3\sqrt{3} \\
&= 12\sqrt{3}
\end{aligned}$$



<u>To Simplify a Radical:</u>

2) Prime factorisation.

Exercises... Textbook handout (5BC)

***Work at your table on your exercises!

1, 4, 9, 16, 25, 36, 49, 64

EXERCISE 5C

1 Write in simplest radical form:

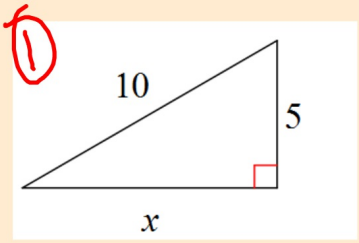
a $\sqrt{12}$	b $\sqrt{28}$	c $\sqrt{54}$	d $\sqrt{60}$
e $\sqrt{99}$	f $\sqrt{52}$	g $\sqrt{40}$	h $\sqrt{63}$
i $\sqrt{48}$	j $\sqrt{125}$	k $\sqrt{147}$	l $\sqrt{175}$
m $\sqrt{176}$	n $\sqrt{150}$	o $\sqrt{275}$	p $\sqrt{2000}$

EXERCISE 5C

1	a $2\sqrt{3}$	b $2\sqrt{7}$	c $3\sqrt{6}$	d $2\sqrt{15}$
	e $3\sqrt{11}$	f $2\sqrt{13}$	g $2\sqrt{10}$	h $3\sqrt{7}$
	i $4\sqrt{3}$	j $5\sqrt{5}$	k $7\sqrt{3}$	l $5\sqrt{7}$
	m $4\sqrt{11}$	n $5\sqrt{6}$	o $5\sqrt{11}$	p $20\sqrt{5}$

Exercises... Textbook handout (5BC)

1)



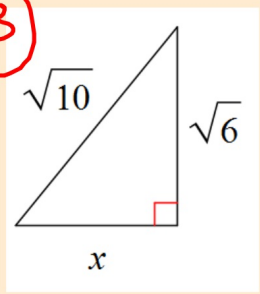
$x^2 + 5^2 = 10^2$

$x^2 + 25 = 100$

$\sqrt{x^2} = \sqrt{75} = \sqrt{25 \cdot 3}$

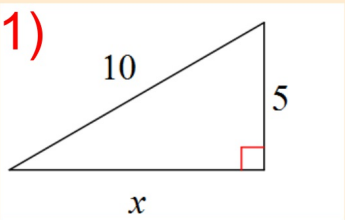
$x = 5\sqrt{3} = \sqrt{25}\sqrt{3}$

3)



Exercises... Textbook handout (5BC)

1)



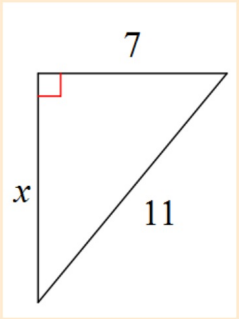
$5^2 + x^2 = 10^2$

$25 + x^2 = 100$

$x^2 = 75$

$x = \sqrt{75} = \sqrt{25 \cdot 3} = \boxed{5\sqrt{3}}$

2)



$7^2 + x^2 = 11^2$

$49 + x^2 = 121$

$-49 \quad -41$

$x^2 = 72 = \sqrt{36 \cdot 2} = \boxed{6\sqrt{2}}$