

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 Radicals	0 1 2	
Wednesday Date: _____ Topic: _____	0 1 2	
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Class Plan:

1. Warm-up



2. Radicals and Surds Examples

A

RADICALS AND SURDS

B

SIMPLIFYING RADICALS

INVESTIGATION 1

PROPERTIES OF RADICALS

C

SIMPLEST RADICAL FORM

3. Practice

(Level 1 or Level 2)

Warm-up

Simplify: Try not to use decimals!!

$$\sqrt{4} = \underline{\hspace{2cm}}$$

$$\sqrt{64} = \underline{\hspace{2cm}}$$

$$\sqrt{8} = \underline{\hspace{2cm}}$$

Warm-up

Simplify: Try not to use decimals!!

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

$$\sqrt{64} = \underline{8}$$

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

$$\begin{aligned}\sqrt{8} &= \sqrt{4 \cdot 2} \\ &= \sqrt{4} \cdot \sqrt{2} \\ &= 2\sqrt{2}\end{aligned}$$

Unit 4: Radicals, Radians, and Unit Circle

Chapter

5

Radicals

- Contents:**
- A** Radicals and surds
 - B** Simplifying radicals
 - C** Simplest radical form
 - D** Adding and subtracting radicals
 - E** Multiplications involving radicals
 - F** Division by radicals

C

SIMPLEST RADICAL FORM

To Simplify a Radical:

- 1) Factor out perfect squares.
- 2) *Prime factorisation*

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

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.

In our warm-up...

Example 7**Self Tutor**

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

$$\begin{aligned}\sqrt{8} \\ &= \sqrt{4 \times 2} \\ &= \sqrt{4} \times \sqrt{2} \\ &= 2\sqrt{2}\end{aligned}$$

4 is the largest perfect square that is a factor of 8.



To Simplify a Radical:

1) Factor out perfect squares.

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.

$$\sqrt{28}$$

$$\sqrt{176}$$

$$\sqrt{147}$$

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.

$$\begin{array}{c} \sqrt{28} \\ \swarrow \quad \searrow \\ \sqrt{2} \quad \sqrt{14} \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ \sqrt{2} \cdot \sqrt{2} \cdot \sqrt{7} \\ \sqrt{2 \cdot 2 \cdot 7} \\ \sqrt{28} \end{array}$$

$$\begin{array}{c} \sqrt{176} \\ \sqrt{16 \cdot 11} \\ \sqrt{16} \sqrt{11} \\ 4\sqrt{11} \end{array}$$

$$\begin{array}{c} \sqrt{147} \\ \swarrow \quad \searrow \\ \sqrt{3} \quad \sqrt{49} \\ \sqrt{3} \cdot \sqrt{49} \\ 7\sqrt{3} \end{array}$$

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.

$$\sqrt{28}$$

$$\begin{array}{l} \sqrt{4 \cdot 7} \\ \sqrt{4} \cdot \sqrt{7} \\ 2\sqrt{7} \end{array}$$

$$\sqrt{176}$$

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

$$\sqrt{147}$$

$$\begin{array}{l} \sqrt{3 \cdot 49} \\ 3 \cdot \sqrt{49} \\ 3 \cdot 7 \\ 21 \end{array}$$

C

SIMPLEST RADICAL FORM

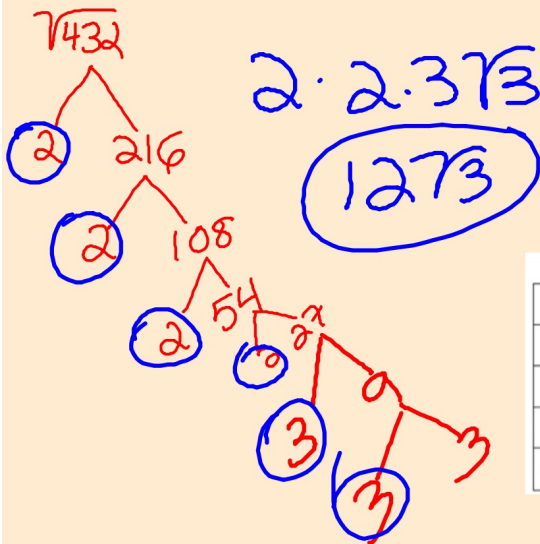
Example 8

Self Tutor

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



It may be useful to find the prime factorisation of the number under the radical sign.



To Simplify a Radical:
2) Prime factorisation.
(Factor Tree!)

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 8****Self Tutor**

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

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



It may be useful to find the prime factorisation of the number under the radical sign.

To Simplify a Radical:
2) Prime factorisation.

Exercises...Choose one of 2 problems to determine homework

(CHALLENGE YOURSELF!)

$3\sqrt{252b^2}$ [Handout \(ID: 1\)](#)

$-5\sqrt{294p^2q^3r}$ [Handout \(ID: 2\)](#)

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 $\sqrt{147}$

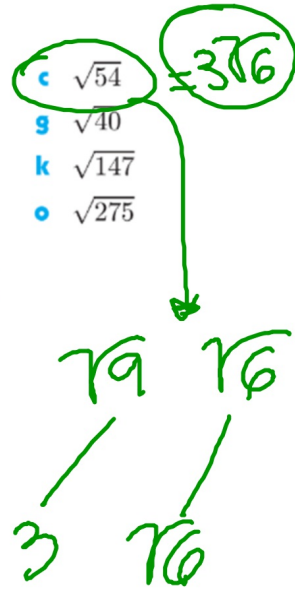
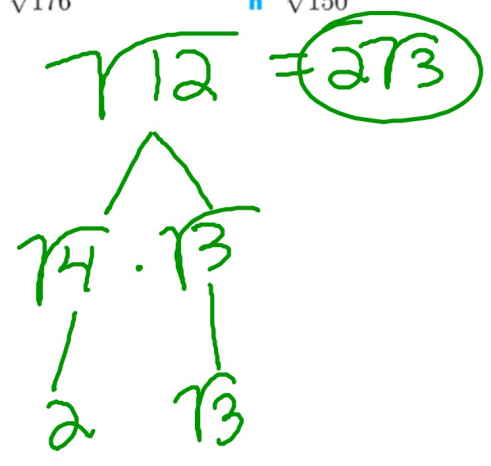
l $\sqrt{175}$

m $\sqrt{176}$

n $\sqrt{150}$

o $\sqrt{275}$

p $\sqrt{2000}$



Exercises..Textbook handout (5C)

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 $\sqrt{2000}$

Textbook handout ANSWERS (5C)

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 $20\sqrt{5}$

Handout (ID: 1)

Algebra 2

Name _____

Radicals! Leave answers in exact form :)

Simplify.

1) $\sqrt{200}$
 $10\sqrt{2}$

2) $\sqrt{196}$
 14

11) $\sqrt{16v^2}$
 $4v$

10) $\sqrt{392x^2}$
 $14x\sqrt{2}$

3) $\sqrt{50}$
 $5\sqrt{2}$

4) $\sqrt{448}$
 $8\sqrt{7}$

13) $3\sqrt{252b^2}$
 $18b\sqrt{7}$

12) $\sqrt{252k^2}$
 $6k\sqrt{7}$

5) $\sqrt{27}$
 $3\sqrt{3}$

6) $\sqrt{72}$
 $6\sqrt{2}$

14) $-\sqrt{64p^2}$
 $-8p$

7) $\sqrt{125}$
 $5\sqrt{5}$

8) $\sqrt{32}$
 $4\sqrt{2}$

Handout (ID: 2)

$$1) \frac{\sqrt{192}}{8\sqrt{3}}$$

$$2) \frac{\sqrt{80}}{4\sqrt{5}}$$

$$7) \frac{3\sqrt{252b^2}}{18b\sqrt{7}}$$

$$8) \frac{-\sqrt{64p^2}}{-8p}$$

$$3) \frac{\sqrt{108}}{6\sqrt{3}}$$

$$4) \frac{\sqrt{150}}{5\sqrt{6}}$$

$$9) \frac{-5\sqrt{294p^2q^3r}}{-35pq\sqrt{6qr}}$$

$$10) \frac{-7\sqrt{384m^3n^3p^3}}{-56mnp\sqrt{6mnp}}$$

$$5) \frac{\sqrt{28v^2}}{2v\sqrt{7}}$$

$$6) \frac{\sqrt{288b^2}}{12b\sqrt{2}}$$

$$11) \frac{5\sqrt{192p^2qr^2}}{40pr\sqrt{3q}}$$

$$12) \frac{3\sqrt{36x^4y^2z^4}}{18x^2z^2y}$$

$$13) \frac{-7\sqrt{30xz}}{-7\sqrt{30xz}}$$

$$14) \frac{7\sqrt{192mp^3q^2}}{56pq\sqrt{3mp}}$$

Handout (ID: 1)

1) $10\sqrt{2}$

5) $3\sqrt{3}$

9) $8n\sqrt{2}$

13) $18b\sqrt{7}$

2) 14

6) $6\sqrt{2}$

10) $14x\sqrt{2}$

14) $-8p$

3) $5\sqrt{2}$

7) $5\sqrt{5}$

11) $4v$

4) $8\sqrt{7}$

8) $4\sqrt{2}$

12) $6k\sqrt{7}$

Handout (ID: 2)

Answers to Radicals! Leave answers in exact form :) (ID: 2)

1) $8\sqrt{3}$

5) $2v\sqrt{7}$

9) $-35pq\sqrt{6qr}$

13) $-7\sqrt{30xz}$

2) $4\sqrt{5}$

6) $12b\sqrt{2}$

10) $-56mnp\sqrt{6mnp}$

14) $56pq\sqrt{3mp}$

3) $6\sqrt{3}$

7) $18b\sqrt{7}$

11) $40pr\sqrt{3q}$

4) $5\sqrt{6}$

8) $-8p$

12) $18x^2z^2y$