

# 5<sup>TH</sup> GRADE MATH

## Parent/Student/ Home Help Packet

Longfellow 2013-2014

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# Place Value Chart

Hundred Billions	Ten Billions	Billions	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Ten Thousandths	Hundred Thousandths				
2	1	0	,	9	8	7	,	6	5	4	,	3	2	1	.	2	3	4	5	6



This Chart shows the place value of the number 210,987,654,321.23456

This is how you say it.

Two hundred ten billion, nine hundred eighty seven million, six hundred fifty four thousand, three hundred twenty one, and twenty three thousand four hundred fifty six hundred thousandths.

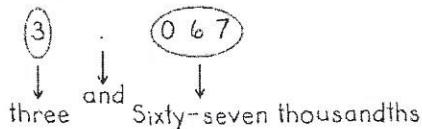
Math-Aids.Com

Standard Form	Expanded Form	Written Form
425	$400 + 20 + 5$	four hundred twenty-five

Math & Tube Math&Tube.com

## Core Lesson

How do you say 3.067?



LEARN WITH ZILLION

## From Word to Standard Form

~~seventeen hundredths~~

$0.\underline{1}\underline{7}$

Expanded Form for 538.3

$$5 \cdot 100 + 3 \cdot 10 + 8 \cdot 1 + 3 \cdot \frac{1}{10}$$

# MULTIPLICATION

$$\begin{array}{r}
 \textcircled{1} \textcircled{1} \\
 245 \\
 \times 3 \\
 \hline
 735
 \end{array}$$

$$\begin{array}{r}
 23 \\
 \times 11 \\
 \hline
 23 \\
 + 230 \\
 \hline
 253
 \end{array}$$

→ need the magic zero

# DIVISION

$$\begin{array}{r}
 34 \\
 2 \overline{) 68} \\
 \underline{-6} \\
 08 \\
 \underline{-8} \\
 0
 \end{array}$$

$$\begin{array}{r}
 82 \\
 12 \overline{) 993} \\
 \underline{-96} \\
 33 \\
 \underline{-24} \\
 9
 \end{array}$$

← remainder

Remainder can be written 3 ways

- ①  $\frac{9}{12}$
- ② r.9
- ③  $\frac{9}{12} = .75$

# GCF

## Greatest Common Factor

Find the GCF of 24 and 36.

The factors of 24 are 1, 2, 3, 4, 6, 8, 12, 24.

The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18, 36.

The common factors of 24 and 36 are 1, 2, 3, 4, 6

The *greatest* common factor of 24 and 36 is 12.

GCF = 12

# LCM

## Least Common Multiple

Multiples of 3:

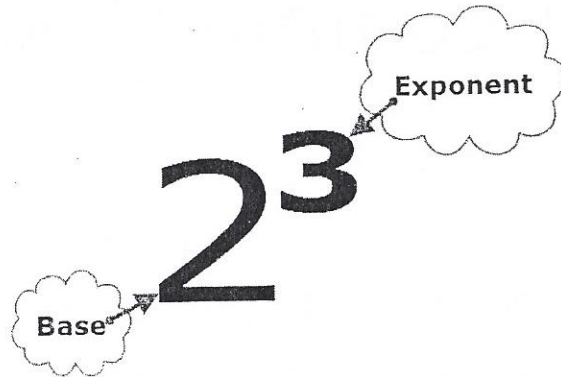
0, 3, 6, 9, 12, 15, 18, 21, 24, ...

Multiples of 4:

0, 4, 8, 12, 16, 20, 24, 28, ...

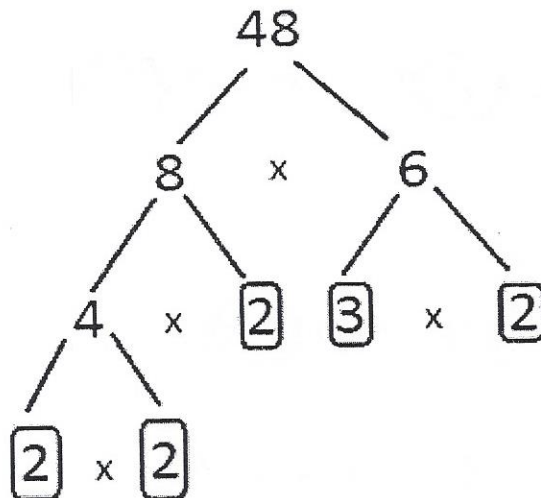
The LCM of 3 and 4 is 12.

# EXPONENTS



$$2^3 = 2 * 2 * 2 = 8$$

# PRIME FACTORIZATION



Final answer:  $2 \times 2 \times 2 \times 2 \times 3$

$2^4 \times 3$

# Fraction to Decimal

-The example below is for changing the fraction  $\frac{5}{8}$  to a decimal. The numerator goes inside the division side. The denominator goes outside. You need to keep adding zeros after the 5 until there is no remainder left or a pattern of the same numbers is formed.

$$\begin{array}{r} .625 \\ 8 \overline{) 5.000} \\ \underline{-48} \phantom{00} \\ 20 \phantom{0} \\ \underline{-16} \phantom{0} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

## Decimal to Percent/Percent to Decimal

Move decimal two places to the right.

$$0.45 = 0.45000 \dots$$

$$0.45 = 0.45000 \dots$$

$$0.45 = 45\%$$

Move decimal two places to the left.

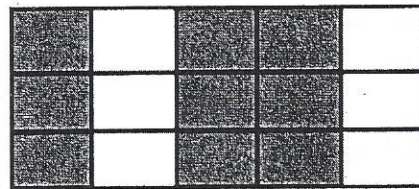
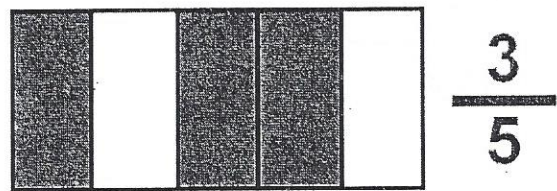
$$75\% \quad 0.75 \quad 0.75$$

2 Places

# EQUIVALENT FRACTIONS

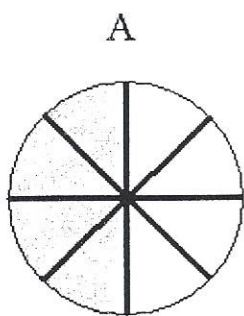
$$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8} \qquad \frac{5}{7} \times \frac{4}{4} = \frac{20}{28}$$

$$\frac{2}{3} \times \frac{5}{5} = \frac{10}{15} \qquad \frac{2}{5} \times \frac{3}{3} = \frac{6}{15}$$

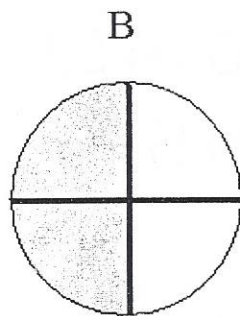
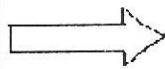


$$\frac{3 \times 3}{5 \times 3} = \frac{9}{15}$$

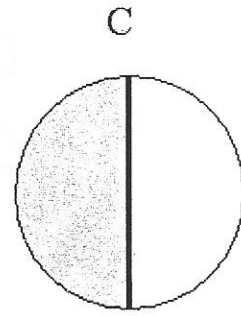
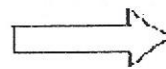
# SIMPLIFYING FRACTIONS



$$\frac{4}{8}$$



$$\div \frac{2}{2} = \frac{2}{4}$$



$$\div \frac{2}{2} = \frac{1}{2}$$



## Common FRACTIONS, DECIMALS, and PERCENTS 5<sup>th</sup> Graders Need to Know

Fraction (try to create three fractions)			Decimal	Percent
1/10	2/10	10/100	0.1	10%
1/4	2/8	25/100	0.25	25%
9/10	18/20	90/100	0.9	90%
1/5	2/10	20/100	0.2	20%
10/10	50/50	100/100	1.00	100%
2/4	1/2	5/10	0.5	50%
2/10	1/5	4/20	0.2	20%
1/3	2/6	3/9	0.3333	33.3%
3/4	6/8	75/100	0.75	75%
3/10	6/20	30/100	0.3	30%
8/10	4/5	80/100	0.8	80%
2/5	4/10	40/100	0.4	40%
4/10	2/5	40/100	0.4	40%
3/5	6/10	60/100	0.6	60%
7/10	14/20	70/100	0.7	70%
2/3	6/9	8/12	0.666	66.6%
5/10	1/2	50/100	0.5	50%
4/5	8/10	80/100	0.8	80%
6/10	3/5	60/100	0.6	60%

# Mixed Number/Improper Fraction

Example 2

Convert  $\frac{20}{3}$  to a mixed number

Divide the numerator by the denominator

$$20 \div 3 = 6 \text{ plus } 2 \text{ remainder}$$

$$\frac{20}{3} = 6\frac{2}{3}$$

6 becomes the whole number  
2 is the numerator of the fraction as shown  
3 is the denominator

$$\begin{array}{r} 12 \rightarrow 2 \frac{2}{3} \\ 3 \overline{) 20} \\ \underline{- 18} \\ 2 \end{array}$$

Divide bottom into top.  
Remainder becomes the new numerator and the denominator stays the same.

$$\begin{array}{r} 9 \ 2 \frac{1}{4} \\ 4 \overline{) 38} \\ \underline{- 36} \\ 2 \end{array}$$

# COMPARING FRACTIONS

$$\textcircled{24} \frac{3}{4} = \frac{6}{8} \textcircled{24}$$

$$3 \times 8 = 6 \times 4$$

$24 = 24 \rightarrow$  these fractions are equivalent

They are equal.

$$\textcircled{33} \frac{3}{7} = \frac{7}{11} \textcircled{49}$$

$$7 \times 7 = 3 \times 11$$

$49 \neq 33 \rightarrow$  these fractions are NOT equivalent

SO,  $\frac{7}{11}$  is greater

# ADD and SUBTRACT FRACTIONS

Model the addition or subtraction problem and complete the number sentence.

$$\frac{3}{8} + \frac{2}{8} = \boxed{\frac{5}{8}}$$



**8**  
Parts



$$\frac{4}{5} - \frac{2}{5} = \boxed{\frac{2}{5}}$$



**5**  
Parts



Denominators are unlike, so you need to make new equivalent fractions so the denominators become alike. See example:

$$\begin{aligned} \frac{5}{6} - \frac{2}{15} &= \frac{5 \times 5}{6 \times 5} - \frac{2 \times 2}{15 \times 2} \\ &= \frac{25}{30} - \frac{4}{30} \\ &= \frac{21}{30} \\ &= \frac{7}{10} \end{aligned}$$

# Multiply Fractions

(multiply straight across, then simplify)

$$\frac{2}{5} \times \frac{6}{7} = \frac{2 \times 6}{5 \times 7} = \frac{12}{35}$$

$$\frac{1}{4} \times \frac{2}{3} = \frac{1 \times 2}{4 \times 3} = \frac{2}{12} = \text{reduces to } \frac{1}{6}$$

# Divide Fractions

- Always flip the 2<sup>nd</sup> fraction, and

$$\frac{1}{3} \div \frac{4}{5}$$

then multiply.

flip the second fraction...  
and multiply!

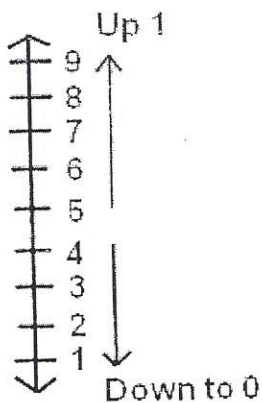
$$\frac{1}{3} \times \frac{5}{4} = \boxed{\frac{5}{12}}$$

Always simplify  
if you can.

# ROUNDING

Round 18.98 to the nearest ten.  
20.00

Round 237.612 to the nearest tenth.  
237.600



## ADD and SUBTRACT DECIMALS

- Line up decimals and place value.

Line up the decimal points	Line up the decimal points
$\begin{array}{r} 22.3 \\ + 34.1 \\ \hline 56.4 \end{array}$	$\begin{array}{r} 1.234 \\ + 4.1 \\ \hline 5.334 \end{array}$

$\begin{array}{r} 2 \quad 10 \quad 13 \quad 10 \\ 31.40 \\ - 27.59 \\ \hline 3.81 \end{array}$	$\longrightarrow$ Borrow as usual
$\downarrow$	
Line up the decimal points	

# MULTIPLY DECIMALS

$$\begin{array}{r} 5 \\ 2.8 \\ \times 7 \\ \hline 196 \end{array}$$

$$\begin{array}{r} 2.8 \times 7 \\ \uparrow \quad \uparrow \\ \textcircled{1} \quad \text{none} \end{array}$$

$$\begin{array}{r} 196 \\ 19.6 \\ \uparrow \textcircled{1} \end{array}$$

So,  $2.8 \times 7 = 19.6$

# DIVIDE DECIMALS

$$\begin{array}{r} 1. \\ 5 \overline{)68.5} \\ \underline{-5} \\ 1 \end{array}$$

$$\begin{array}{r} 13. \\ 5 \overline{)68.5} \\ \underline{-5} \downarrow \\ 18 \\ \underline{-15} \\ 3 \end{array}$$

$$\begin{array}{r} 13.7 \\ 5 \overline{)68.5} \\ \underline{-5} \downarrow \\ 18 \\ \underline{-15} \downarrow \\ 35 \\ \underline{-35} \\ \bullet \end{array}$$

$$\begin{array}{r} .4 \\ 5 \overline{)2.35} \\ \underline{-20} \\ 3 \end{array}$$

→

$$\begin{array}{r} .47 \\ 5 \overline{)2.35} \\ \underline{-20} \downarrow \\ 35 \\ \underline{-35} \\ \bullet \end{array}$$

So,  $6.85 \div .5 = 13.7$

So,  $2.35 \div 5 = .47$

# Order of Operations – Help Sheet

B-PE(MD)(AS)

Bubba, Please Excuse My Dear Aunt Sally

B – Brackets

P – Parenthesis

E – Exponents

M – Multiplication

D – Division

A – Addition

S – Subtraction

## Rules

- Always work from left to right, using the rules above
- When you have multiplication and division in the same problem, always do whatever comes first, from left to right.
- When you have addition and subtraction in the same problem, always do whatever comes first, from left to right.
- Always work going straight down.
- Each time you do a step, rewrite the rest of the problem that is left to do.

## Example:

$$20 - \underline{4 \times 2} + 3$$

$$\underline{20 - 8} + 3$$

$$12 + 3$$

$$\textcircled{15}$$

5<sup>th</sup> Grade Measurement Conversions

60 seconds = 1 minute 24 hours = 1 day 365 days = 1 year 4 weeks = 1 month 7 days = 1 week	12 inches = 1 foot 3 feet = 1 yard 36 inches = 1 yard 5,280 feet = 1 mile	10 millimeters = 1 centimeter 100 centimeters = 1 meter 1,000 millimeters = 1 meter 1,000 meters = 1 kilometer
1,000 grams = 1 kilogram 1,000 milligrams = 1 gram	1,000 milliliters = 1 liter 1,000 liters = 1 kiloliter	16 ounces (oz.) = 1 pound (lb.) 2,000 pounds = 1 ton 2 cups = 1 pint 2 pints = 1 quart 4 quarts = 1 gallon 8 fl oz = 1 cup 3 teaspoons = 1 tablespoon



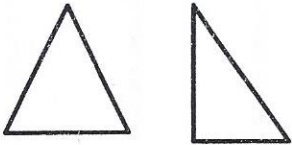
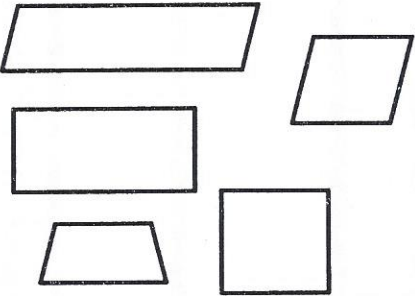


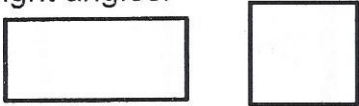
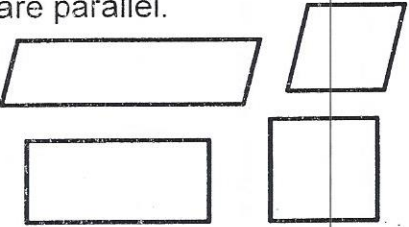

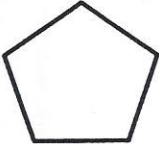
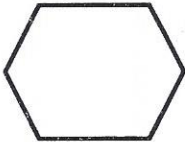
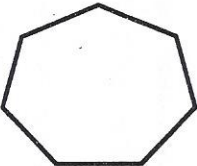
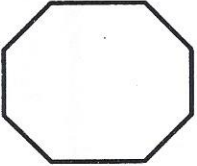
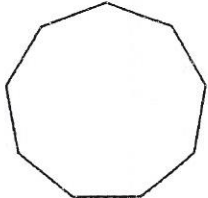
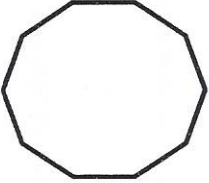
# Divisibility Rules

You can divide by:	if
2	the number 2 goes into it evenly
3	when you find the sum of the digits, the number 3 goes into the sum evenly
4	the last two digits can be divided by 4 evenly
5	the last number is a 0 or a 5
6	you were able to evenly divide it by 2 AND 3
9	when you find the sum of the digits, the number 9 goes into the sum evenly
10	the last number is a 0











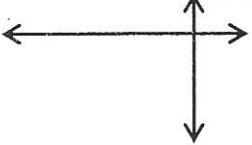
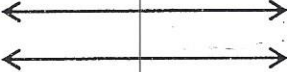


# Geometry Study Guide

## SHAPES

<p style="text-align: center;"><b><u>Polygon</u></b></p> <p>A polygon is a closed plane geometric figure composed of at least three line segments that do not cross. None of the sides are curved.</p>	<p style="text-align: center;"><b><u>Triangle</u></b></p> <p>3-sided shape</p> 	<p style="text-align: center;"><b><u>Quadrilateral</u></b></p> <p>Any polygon with 4-sides</p> 
<p style="text-align: center;"><b><u>Square</u></b></p> <p>A special rectangle with 4 sides that are exactly the same length, and 4 right angles.</p> 	<p style="text-align: center;"><b><u>Rhombus</u></b></p> <p>A quadrilateral with 4 sides that are exactly the same length, and 2 sets of parallel lines.</p> 	<p style="text-align: center;"><b><u>Rectangle</u></b></p> <p>A quadrilateral with opposite sides being the same length and parallel. Also it has 4 right angles.</p> 
<p style="text-align: center;"><b><u>Parallelogram</u></b></p> <p>A quadrilateral with opposite sides the same length and are parallel.</p> 	<p style="text-align: center;"><b><u>Trapezoid</u></b></p> <p>A quadrilateral with only 1 set of parallel lines.</p> 	<p style="text-align: center;"><b><u>Pentagon</u></b></p> <p>A polygon with 5-sides</p> 
<p style="text-align: center;"><b><u>Hexagon</u></b></p> <p>A polygon with 6-sides</p> 	<p style="text-align: center;"><b><u>Heptagon or Septagon</u></b></p> <p>A polygon with 7-sides</p> 	<p style="text-align: center;"><b><u>Octagon</u></b></p> <p>A polygon with 8-sides</p> 
<p style="text-align: center;"><b><u>Nonagon</u></b></p> <p>A polygon with 9-sides</p> 	<p style="text-align: center;"><b><u>Decagon</u></b></p> <p>A polygon with 10-sides</p> 	

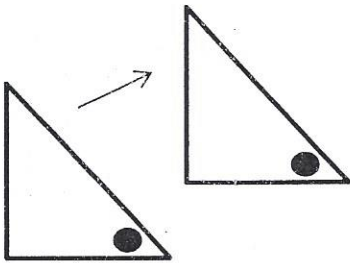
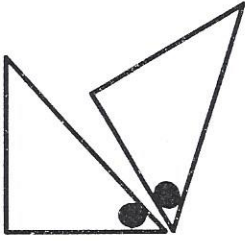
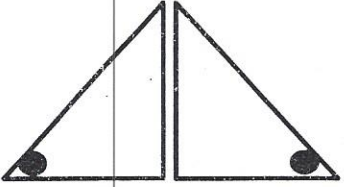
# LINES AND ANGLES

<p style="text-align: center;"><b>Point</b></p> 	<p style="text-align: center;"><b>Endpoint</b></p> 	<p style="text-align: center;"><b>Vertex (Vertices)</b></p> 
<p style="text-align: center;"><b>Line</b></p> 	<p style="text-align: center;"><b>Line Segment</b></p> 	<p style="text-align: center;"><b>Ray</b></p> 
<p style="text-align: center;"><b>Right Angle</b></p> 	<p style="text-align: center;"><b>Acute Angle</b></p> 	<p style="text-align: center;"><b>Obtuse Angle</b></p> 
<p style="text-align: center;"><b>Intersecting Lines</b></p> 	<p style="text-align: center;"><b>Perpendicular Lines</b></p> 	<p style="text-align: center;"><b>Parallel Lines</b></p> 

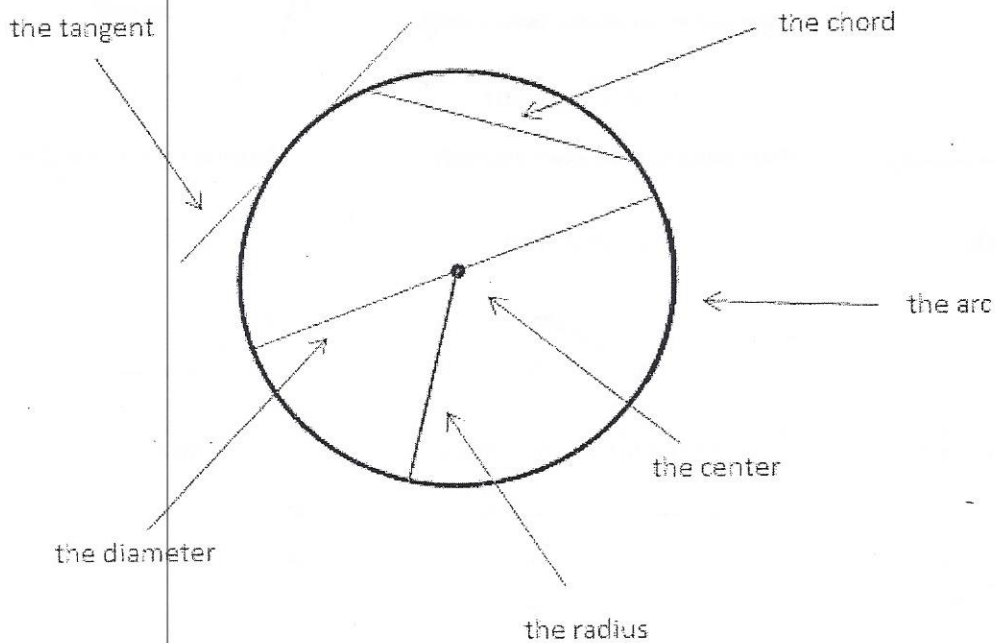
**Congruent Shapes:** They are exactly the same shape, same size, and have the same size angles. They shapes have just gone through some type of transformation.



## TRANSFORMATIONS

<p style="text-align: center;"><b>Translation (Slide)</b></p> 	<p style="text-align: center;"><b>Rotation (Turn)</b></p> 	<p style="text-align: center;"><b>Reflection (Flip)</b></p> 
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# PARTS OF A CIRCLE

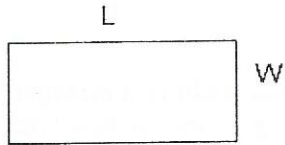


Diameter is double the radius.  
Radius is half the diameter.

**Example:** Diameter is 12m. Radius is 6m.

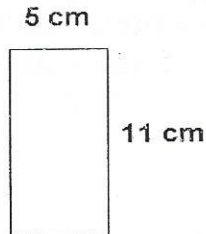
**Example:** Radius is 15cm. Diameter is 30cm.

# AREA



$$\text{Area} = L \times W$$
$$\text{Area} = \text{Length} \times \text{Width}$$

Example:



$$\text{Area} = L \times W$$
$$\text{Area} = 5 \text{ cm} \times 11 \text{ cm}$$
$$\text{Area} = 55 \text{ cm}^2$$

# PERIMETER

## Perimeter of a rectangle

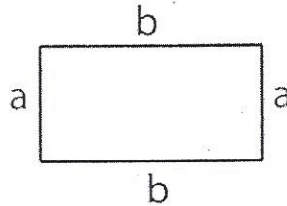
The opposite sides of a rectangle are congruent.

$$P = a + b + a + b$$

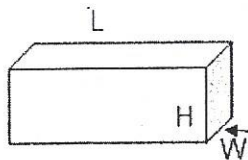
$$P = 2a + 2b$$

Example:

If  $a = 3$  units and  $b = 5$  units then  
Perimeter ( $P$ ) =  $3 + 5 + 3 + 5 = 16$  units

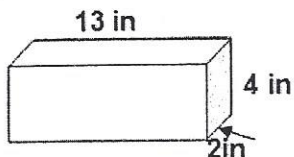


# VOLUME



$$\text{Volume} = L \cdot W \cdot H$$
$$\text{Volume} = \text{Length} \cdot \text{Width} \cdot \text{Height}$$

Example:

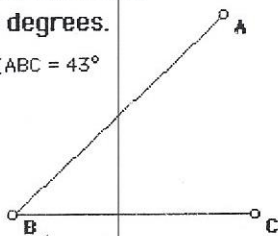


$$\text{Volume} = L \cdot W \cdot H$$
$$\text{Volume} = 13 \text{ cm} \cdot 2 \text{ cm} \cdot 4 \text{ cm}$$
$$\text{Volume} = 104 \text{ cm}^3$$

# TYPES OF ANGLES

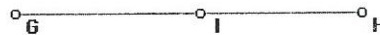
Angle ABC is an acute angle since it is between 0 and 90 degrees.

$$m\angle ABC = 43^\circ$$

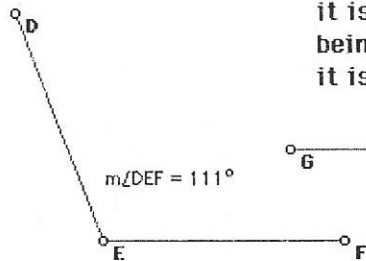


Angle GIH is a straight angle since it is a 180 degree angle. Notice that it is a line! Think about it being a straight line--so it is a straight angle

$$m\angle GIH = 180^\circ$$



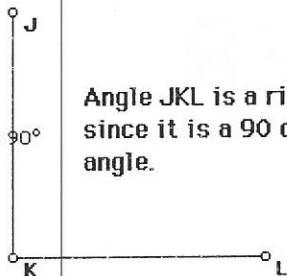
$$m\angle DEF = 111^\circ$$



Angle DEF is an obtuse angle since it is between 90 and 180 degrees

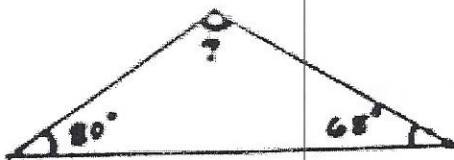
$$m\angle JKL = 90^\circ$$

Angle JKL is a right angle since it is a 90 degree angle.



## Angles in a Triangle

- 180 degrees total

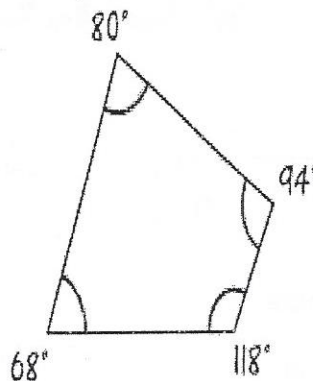


$$80^\circ + 65^\circ = 145^\circ$$

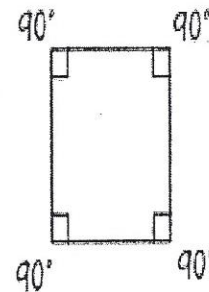
$$180^\circ - 145^\circ = 35^\circ$$

## Angles in a Quadrilateral

- 360 degrees total



$$68^\circ + 118^\circ + 94^\circ + 80^\circ = 360^\circ$$



$$4 \times 90^\circ = 360^\circ$$

Name \_\_\_\_\_

Period \_\_\_\_\_

## Mean, Median and Mode Reference Sheet

When analyzing data knowing the average is very beneficial. There are several ways to calculate the average. There are three types of averages: mean, median and mode.

**Mean** - One type of average is called the mean. Pay special attention to finding the mean since this is sometimes repeated in finding the median. The mean or numerical average is calculated by adding up all of the numbers and then dividing by the total number of items in the list.

There are two steps to finding the mean.

For Example:

1. Add up the numbers.

$$\begin{array}{r} 75 \\ 62 \\ 85 \\ + 90 \\ \hline 312 \end{array}$$

2. Take the total (312) and divide it by 4. Divide by 4 because four numbers were added up in step one. If nine numbers were added up in step one, you would divide by nine instead of four. Once we have divided 312 by 4, we get 78. The mean is 78.

$$\begin{array}{r} 78 \\ 4 \overline{) 312} \end{array}$$

**Median** - To find the median, we need to get the *middle* number in a set of data. To find the median, place all the numbers in order from least to greatest. If the ordered list has an odd number of entries, the median is the middle number in the list. If the list has an even number of entries, the median is found by adding the two center numbers together and dividing by two.

Odd amount of numbers:

12, 78, 46, 92, 100

1. Put them in order  
12, 46, 78, 92, 100
2. Find the center number  
12, 46, 78, 92, 100

78 is the median

Even amount of numbers:

31, 51, 18, 100, 97, 71

1. Put in order: 18, 31, 51, 71, 97, 100
2. Find the middle number:  
18, 31, 51, 71, 97, 100
3. Find the mean of the middle numbers:

$$51 + 71 = 122 \quad \frac{122}{2} = 61$$

61 is the median

**Mode** - The mode is the number that appears most often in a list of numbers. In the following sequence, the number 12 will be the mode.

9, 12, 18, 24, 36, 12, 5

**Range** - highest number minus lowest number.

