Cranford Public Schools

Summer Math Practice

Students Entering 7th Grade

7^{th} Grade - Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Write an algebraic expression to represent unknown quantities.

• A **variable** is a symbol, usually a letter, used to represent a number.
• **Algebraic expressions** are combinations of variables, numbers, and at least one operation.

Examples:

The sum of 5 and some number is written as: **5 + n** because the operation that is associated with the word **sum** is addition.

The difference of a number and three tenths is written as: **n - .3** because the operation that is associated with the word **difference** is subtraction.

1.) a number plus $\frac{1}{2}$	**2.)** a number minus .7
3.) the difference of twenty-one hundredths and a number	**4.)** the sum of a number and forty-six

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Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Evaluate an algebraic expression.

- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.
- **Multiplication** in algebra can be shown as $4n$ or $4 \times n$
- The variables in an algebraic expression can be replaced with any number.
- Once the variables have been replaced, you can **evaluate**, or find the value of, the algebraic expression.

Examples:

Evaluate $44 + n$ if $n = 9$

$44 + n$	original expression
$44 + 9$	replace the variable with it's value
53	solution

1.)

Evaluate $150 + n$ if $n = 15$

2.)

Evaluate $12n$ if $n = 9$

3.)

Evaluate $15n + 19$ if $n = \frac{1}{3}$

4.)

Evaluate $30n$ if $n = 2.5$

5.)

Evaluate $24n \div k$ if $n = 6$ and $k = 8$

6.)

Evaluate $nk - 2b + 8$ if $b = 1.5$, $k = 8$, and $n = 7$

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Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Evaluate numeric expressions using order of operations.

- A **numerical expression** is a combination of numbers and operations.
- The **Order of Operations** tells you which operation to perform first so that everyone gets the same final answer.
- The **Order of Operations** is: **Parentheses, Exponents, Multiplication or Division (left to right), and Addition or Subtraction (left to right.)**

Examples:

$48 \div (3 + 3) - 2^2$	original expression
$48 \div 6 - 2^2$	simplify the expression inside the parentheses
$48 \div 6 - 4$	calculate 2^2
$8 - 4$	divide 48 by 6
4	subtract 4 from 8

1.) $(8 + 1) \times 12 - 13$	**2.)** $13 \times 4 - 72 \div 8$
3.) $88 - 16 \times 5 + 2 - 3$	**4.)** $100 \div 5^2 \times 4^3$
5.) $45 \div 9 - 3 + 2 \times 3$	**6.)** $(5^2 + 3^3) \times (81 + 9) \div 10$

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Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Determine the unknown in a linear equation (addition & subtraction).

• **Addition equations**: Subtract the same number from each side of the equation so that the two sides remain equal.
• **Subtraction equations**: Add the same number to each side of the equation so that the two sides remain equal.

Examples:

b + 3 = 6 original equation	b – 8 = 4 original equation
- 3 - 3 subtract 3 from each side	+8 +8 add 4 to each side
b + 0 = 3 solution	b + 0 = 12 solution
b = 3 simplify	b = 12 simplify

1.) g + 5 = 12	**2.)** s – 12 = 29
3.) m + 3.5 = 10.5	**4.)** k – 5.5 = 8.5
5.) w + 6.25 = 22	**6.)** g – 3.75 = 49.75

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Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS
Objective: Determine the unknown in a linear equation (multiplication & division).

- In a **multiplication equation**, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation 2x = 8, the coefficient is 2.
- **Multiplication equations**: Divide both sides by the coefficient so that the two sides remain equal.
- In a **division equation**, the number by which the variable is divided is called the **divisor**. In the division equation $\frac{x}{4}$, 4 is the divisor.
- **Division equations**: Multiply both sides of the equation by the divisor so that the two sides remain equal.

Examples:

$\frac{4b}{4} = \frac{16}{4}$	original equation	$\frac{m}{6} = 11$	original equation
	divide both sides by 4	$6 \times \frac{m}{6} = 11 \times 6$	multiply each side by 6
$1b = 4$	solution	$1m = 66$	solution
$b = 4$	simplify	$m = 66$	simplify

1.)

$7x = 63$

2.)

$\frac{k}{9} = 8$

3.)

$5b = 3.55$

4.)

$\frac{n}{7} = 5.55$

5.)

$12m = 84.72$

6.)

$\frac{p}{13} = 2.67$

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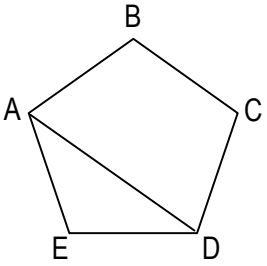
Unit: KNOWLEDGE of GEOMETRY

Objective: Identify and describe diagonal line segments.

• A line segment connecting two vertices of a polygon is either a side or a **diagonal**.

Examples:

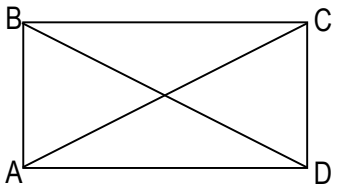


$\overline{AE}$ is a side of polygon *ABCDE*

$\overline{AD}$ is a **diagonal** of polygon *ABCDE*

1.)

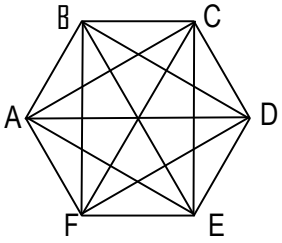
Is $\overline{AB}$ a diagonal of polygon *ABCD*?



YES NO

2.)

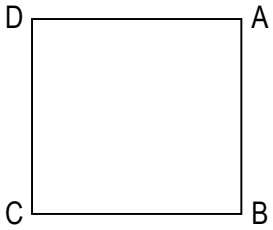
Circle all of the diagonals of polygon *ABCDEF*.



$\overline{AB}$	$\overline{AC}$	$\overline{AD}$	$\overline{AE}$	$\overline{AF}$
$\overline{BA}$	$\overline{BC}$	$\overline{BD}$	$\overline{BE}$	$\overline{BF}$
$\overline{CA}$	$\overline{CB}$	$\overline{CD}$	$\overline{CE}$	$\overline{CF}$
$\overline{DA}$	$\overline{DB}$	$\overline{DC}$	$\overline{DE}$	$\overline{DF}$
$\overline{EA}$	$\overline{EB}$	$\overline{EC}$	$\overline{ED}$	$\overline{EF}$
$\overline{FA}$	$\overline{FB}$	$\overline{FC}$	$\overline{FD}$	$\overline{FE}$

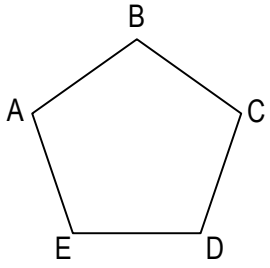
3.)

Name one diagonal of polygon *WXYZ*



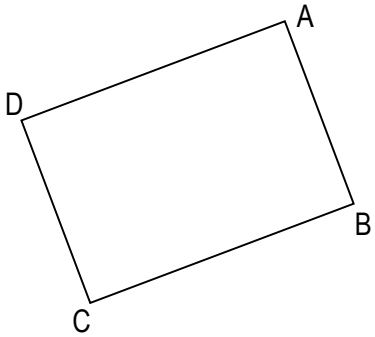
4.)

Name all of the diagonals polygon *ABCDE*



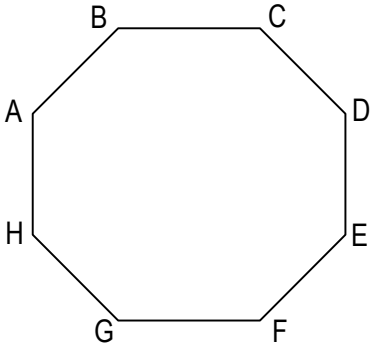
5.)

Draw one diagonal on polygon KLMN



6.)

Draw all of the diagonals of polygon *ABCDEFGH*



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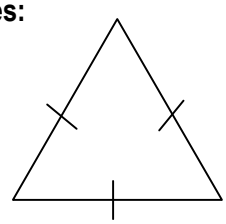
Unit: KNOWLEDGE of GEOMETRY
Objective: Compare or classify triangles as scalene, equilateral, or isosceles.

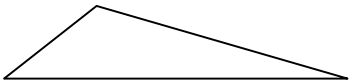
Triangles are polygons that have **three sides**, three vertices, and three angles.
Triangles can be **classified by the number of congruent sides**, which are sides of equal length.
The same markings on the sides of a triangle show that the sides are **congruent**.

Examples:



Equilateral triangle
Three congruent sides

Isosceles triangle
Two congruent



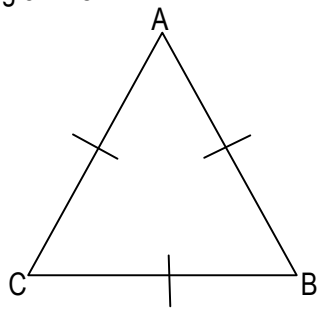
Scalene triangle
No congruent sides

1.) Shown is Equilateral triangle *ABC*.

$\overline{AB}$ = 6 cm.

$\overline{BC}$ = _____

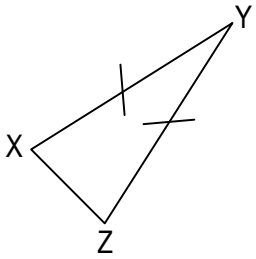
$\overline{CA}$ = _____



2.) Shown is Isosceles triangle XYZ.

$\overline{XY}$ = 5 in.

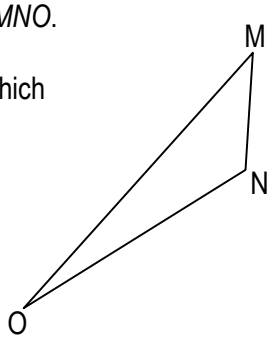
What must be the length of side $\overline{YZ}$?



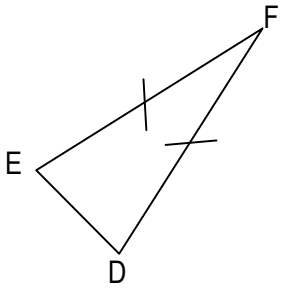
3.) Shown is Scalene triangle *MNO*.

Circle the set of numbers which could be the lengths of the three sides.

3 cm, 5 cm, 6 cm
2 cm, 4 cm, 4 cm
2 cm, 2 cm, 2 cm



4.) Classify triangle *DEF*.



Equilateral

Scalene

Isosceles

5.) Draw an Equilateral triangle. Label the vertices. Name the sides and their lengths.

6.) Draw a Scalene triangle. Label the vertices. Name the sides and their lengths.

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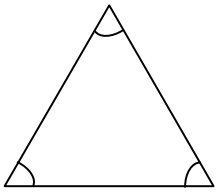
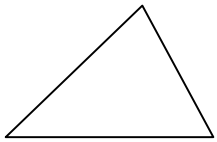
Unit: KNOWLEDGE of GEOMETRY
Objective: Compare or classify triangles as equiangular, obtuse, acute, or right.

Triangles are polygons that have three sides, three vertices, and **three angles**.
Triangles can be **classified according to their angles.**
All triangles have at least 2 acute angles. **Acute, Right, and Obtuse triangles** are **classified according to their third angle.**
The same markings on the angles of a triangle show that the angles are **congruent**.

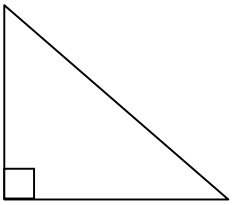
Examples:



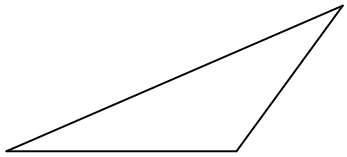
Equiangular triangle
Three congruent angles



Acute triangle
Three acute angles

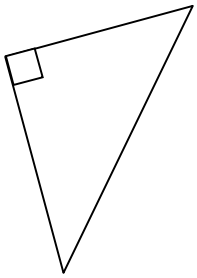


Right triangle
One right angle



Obtuse triangle
One obtuse angle

1.)

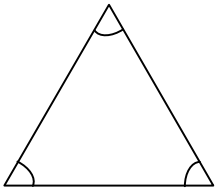


What type of triangle is this?

Circle the correct answer:

Equiangular
Acute
Right
Obtuse

2.)



What type of triangle is this?

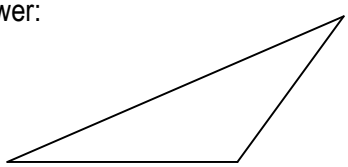
Circle the correct answer:

Equiangular
Acute
Right
Obtuse

3.) What type of triangle is this?

Circle the correct answer:

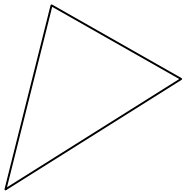
Equiangular
Acute
Right
Obtuse



4.) What type of triangle is this?

Circle the correct answer:

Equiangular
Acute
Right
Obtuse



5.) Melissa needs to draw some triangles as part of her Geometry homework. She confuses acute and obtuse triangles. Which triangle should have one angle that is greater than 90^{o}? Why?

6.) Jack and his dad are building a triangular pen for Jack's new puppy, a Jack Russell Terrier. Jack's dad wants to make the project as easy as possible. Which type of triangle should they use as a model? Why?

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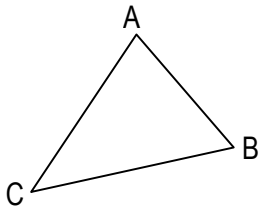
Unit: KNOWLEDGE of GEOMETRY

Objective: Use the concept of the sum of angles in any triangle is 180° to determine the third angle measure of a triangle given two angle measures without a diagram.

Triangles are polygons that have three sides, three vertices, and **three angles**.
The **sum** of the measures of the angles of a triangle is **180°.**

Examples:



Angle A = 65°
Angle B = 60°
Angle C = ?

180 – 65 – 60 = 55 Angle C = 55°

1.) Given triangle XYZ:

Angle X = 90°

Angle Y = 45°

Angle Z = _____°

2.) Given triangle MNO:

Angle M = 15°

Angle N = _____°

Angle O = 135°

3.) Given right triangle ABC:

Angle A is the right angle

Angle B = 55°

Angle C = _____°

4.) Given equiangular triangle FGH:

What is the measure of …

Angle F? _____°

Angle G? _____°

Angle H? _____°

5.) Given triangle JKL:

Angle J = 120°
Angle K = 50°
Angle L = 20°

Is this possible? Explain why or why not using math.

6.) Teri is making a scrapbook page of her trip to the art exhibit, "Geometry in Your World." She wants to use a large triangle as her background focus. She draws a triangle with the first two angle measures of 100° and 25°.

What is the angle measure of the third angle? _____°

Please show your work:

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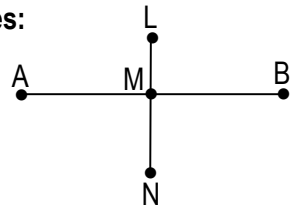
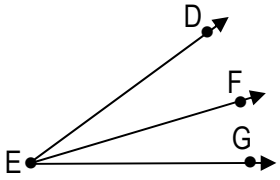
Unit: KNOWLEDGE of GEOMETRY
Objective: Identify, or describe angle relationships using perpendicular bisectors or angle bisectors.

To **bisect** something means to separate it into **two equal parts**.
When a **line segment** is **bisected with a perpendicular line segment**, you have **two line segments that are congruent** (or equal in length.)
The original line segment and the perpendicular line segment **meet at right (90°) angles**.
When an **angle is bisected**, the **resulting two angles are congruent**.

Examples:



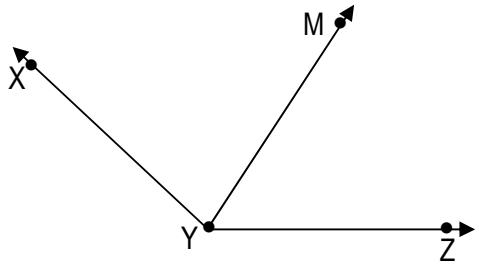
Line segment $\overline{LN}$ is the perpendicular bisector of line segment $\overline{AB}$, so line segment $\overline{AM}$ is congruent to line segment $\overline{MB}$. Angle LMB is 90°.



Ray $\overrightarrow{EF}$ is the bisector of angle DEG, so angle DEF is congruent to angle FEG.

1.) Given angle XYZ and bisector $\overrightarrow{YM}$, name the 2 angles that are congruent.

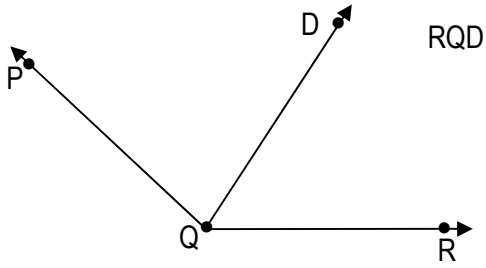
Angle _____ and angle _____ are congruent.



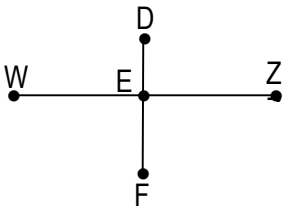
2.) Angle PQR measures 124°. Ray $\overrightarrow{QD}$ bisects angle PQR. What is the measure of angle DQR and angle RQD?

DQR = _____°

RQD = _____°



3.)



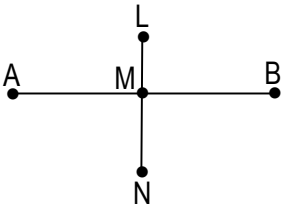
Line segment $\overline{WZ}$ is the original line segment.

Line segment $\overline{DF}$ is the _____ _____.

Line segments $\overline{EW}$ and $\overline{EZ}$ are _____.

The measure of angle WEF is _____°.

4.)



Name the perpendicular bisector: _____

Name the 2 congruent line segments: _____ & _____

Name all of the right angles: _____

If line segment $\overline{MB}$ = 9 mm,
then line segment $\overline{AB}$ = _____

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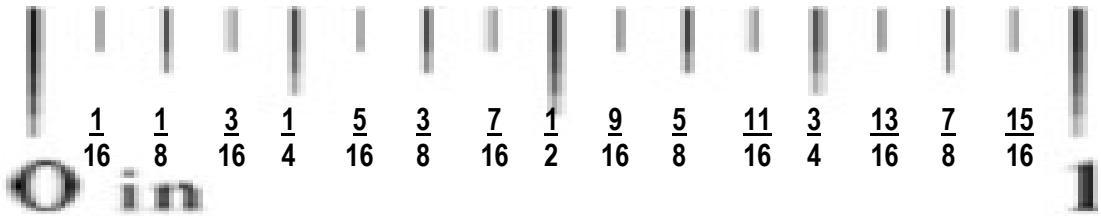
Unit: KNOWLEDGE of MEASUREMENT

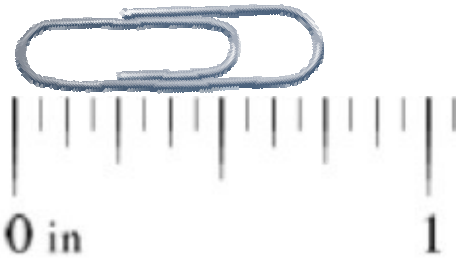
Objective: Measure length to the nearest 1/16 inch using a ruler.

You will need a ruler for this lesson!

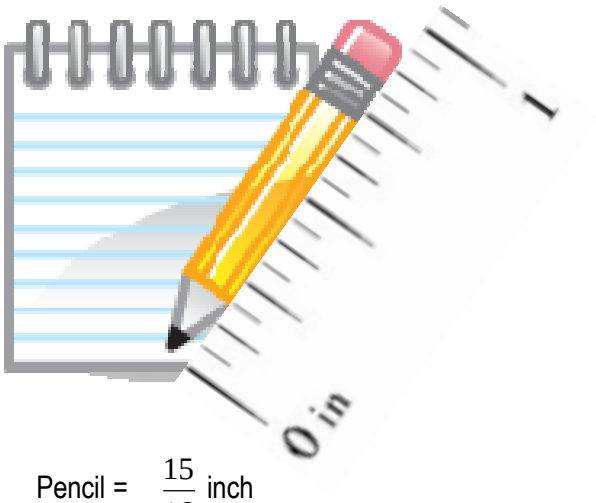


****Note: This ruler is NOT to scale.**

Examples: Measure the following objects to the nearest 1/16 inch.



Paperclip = $\frac{3}{4}$ inch



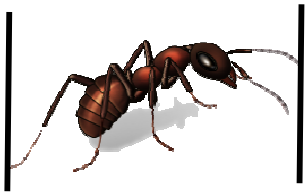
Pencil = $\frac{15}{16}$ inch

Measure the objects to the nearest 1/16 inch.

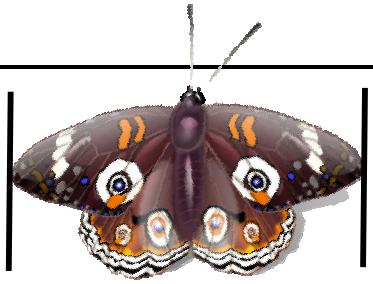
1.)

2.)

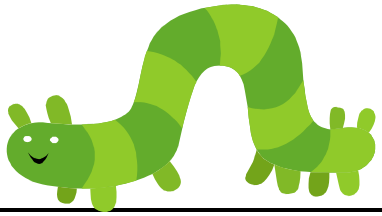
3.)



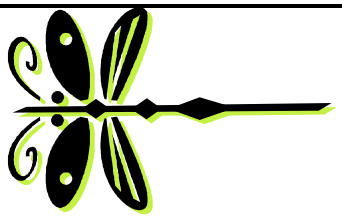
4.)



5.)



6.)



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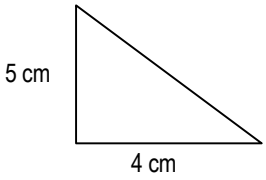
Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the area of a triangle with whole number dimensions.

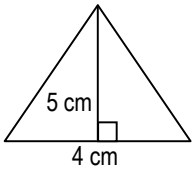
The area (**A**) of a triangle is one half the product of the base (**b**) and the height (**h**).
The formula for finding the area of a triangle is: **A = ½ bh** and is measured in square units.

Examples:



A = ½ bh A = ½ x 4 x 5 A = ½ x 20

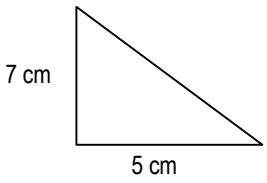
A = 10 cm^2



A = ½ bh A = ½ x 4 x 5 A = ½ x 20

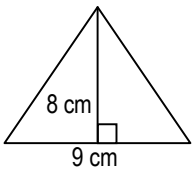
A = 10 cm^2

1.) Determine the area of the triangle.



A = _____ cm^2

2.) Determine the area of the triangle.



A = _____

3.) Determine the area of an obtuse triangle with a height of 11 cm and a base of 22 cm.

A = _____

4.) Determine the area of an isosceles triangle with a base of 13 cm and a height of 26 cm.

A = _____

5.) World famous pastry chef, Chen Lee, is designing a birthday cake for his son, who is a Geometry teacher. He has 4 layers, all triangles. He wants to put the largest layer (in area) on the bottom and the smallest layer on the top. Determine the area of each layer and order them from largest to smallest (4 = largest, 1 = smallest)

___ Milk Chocolate layer b = 12" h = 6" A =

___ Yellow cake layer b = 7" h = 11" A =

___ Dark Chocolate layer b = 4" h = 17" A =

___ White cake layer b = 9" h = 9" A =

6.) Natasha's dorm room is shaped like a triangle. The college brochure says it has an area of 875 square feet. The room is 35 feet long. Determine the width of the room at its widest point.

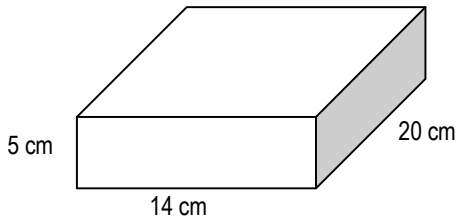
7th Grade - Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the volume of rectangular prisms with whole number dimensions.

The amount of space inside a three-dimensional figure is the **volume** of the figure.
Volume (**V**) is measured in **cubic units**.
The volume of a **rectangular prism** is related to its dimensions. **Volume (V) = length (l) x width (w) x height (h)**

Examples:

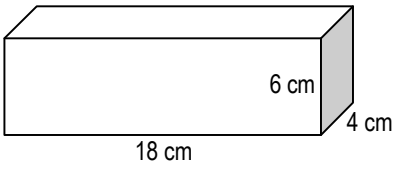


V = l x w x h

V = 20 x 14 x 5

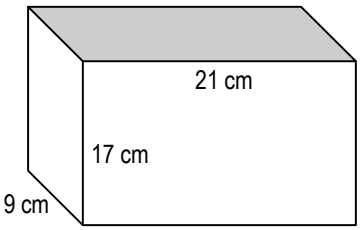
V = 1400 cm^3

1.) Determine the volume of the rectangular prism. Please show your work.



V = _____

2.) Determine the volume of the rectangular prism. Please show your work.



V = _____

3.) Determine the volume of a rectangular prism with a length of 13 cm, a width of 55 cm, and a height of 65 cm. Please show your work.

4.) Determine the volume of a rectangular prism with a height of 35 cm, a length of 89 cm, and a width of 15 cm. Please show you work.

5.) Tyrone has a fish tank that measures 36 in. long, 24 in. high, and 18 in. wide. He wants to fill the fish to a height of 14 inches. What will be the volume of water in the tank? Please show your work.

V = _____

Draw the tank and label the dimensions. Draw the water level. This does not need to be drawn to scale.

6.) Shanika has a lamp that she wants to send to her sister in Baltimore. The lamp is in the shape of a rectangular prism. It measures 14" high, 9" wide, and 3" long. She wants to buy a box so that there is 1" all around the lamp for bubble wrap.

What should be the dimensions of the box?

What is the volume of the box? Please show your work.

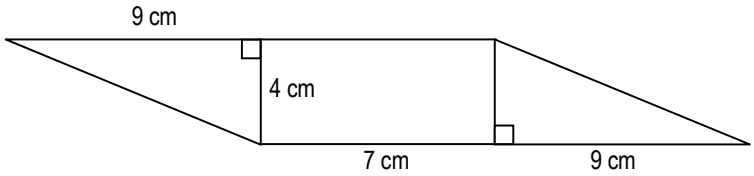
7th Grade - Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Estimate and determine the area of composite figures using no more than four polygons (triangles or rectangles) with whole number dimensions.

A **composite figure** is made by **combining two different figures**.
The **area** of a composite figure is found by **adding the areas of the individual figures**.

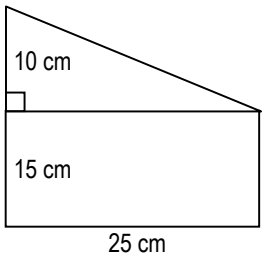
Examples:



A = ½ bh	A = lw	A = ½ bh
A = ½ x 4 x 9	A = 7 x 4	A = ½ x 4 x 9
A = 18 cm^2	A = 28 cm^2	A = 18 cm^2

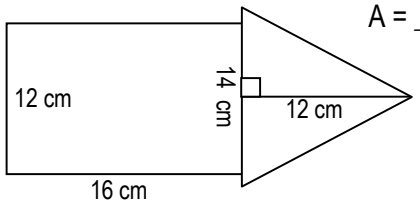
Area of composite figure = 18 + 28 + 18 = 64 cm^2

1.) Determine the area of the composite figure. Please show your work.



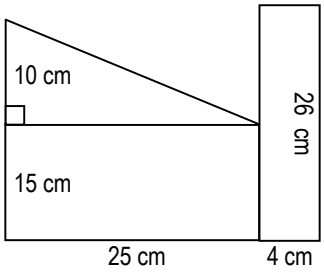
A = _____

2.) Determine the area of the composite figure. Please show your work.



A = _____

3.) Determine the area of the composite figure. Please show your work.



A = _____

4.) Determine the area of the composite figure that is made up of 1 square and 3 congruent right triangles. Each triangle shares its base with one side of the square. One side of the square measures 6cm. The height of each triangle is 4 times its base. Please show your work.

5.) Dallas is working on the decorations for the 8th grade dance. He is making a large composite wall decoration that is made of 2 congruent rectangles and 2 congruent triangles. The rectangles measure 5 ft by 7 ft. The triangles have a base of measurement of 7 ft and a height measurement of 9 ft. What is the composite area of the wall decoration?

What is the composite area of 4 of them?

6.) The 8th grade dance committee liked Dallas' decorations so much that they decided to paint a huge one on the floor. They tripled the dimensions of the rectangles and the triangles?

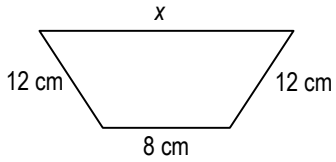
What is the area of the floor decoration?

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT
Objective: Determine the missing side of a quadrilateral given the perimeter using whole number dimensions.

A **quadrilateral** is any four-sided, closed, 2-dimensional figure.
The **perimeter (P)** of any quadrilateral is the sum of the lengths of its four sides.
The **missing side** of a quadrilateral can be found using addition and subtraction.

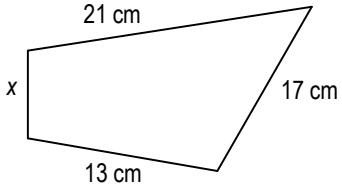
Examples:



P = 52 cm

P = s + s + s + s
52 = 12 + 8 + 12 + *x*
52 = 32 + *x*
- 32 - 32
20 = *x* The length of the missing side is 20 cm.

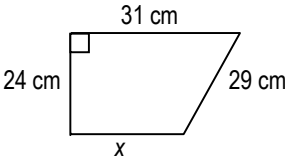
1.) Determine the missing side of the quadrilateral. Please show your work.



P = 60 cm

x = _____

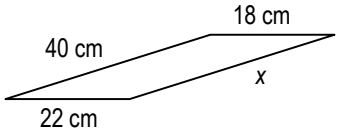
2.) Determine the missing side of the quadrilateral. Please show your work.



P = 99 cm

x = _____

3.) Determine the missing side of the quadrilateral. Please show your work.



P = 124 cm

x = _____

4.) Determine the missing side of a quadrilateral that has a perimeter of 251 cm and three sides measuring 39 cm, 72 cm, and 89 cm. Please show your work.

5.) Heather wants to build a pen for her new beagle puppy. She is going to build it in the shape of a quadrilateral. She decides that she wants the perimeter to be 360 ft. She already has 360 feet of fence. She measures out the first side to be 90 ft, the second side to be 110 feet, and the third side to be 100 feet. She tells her friend to measure out the fourth side to be 80 feet.

Is this correct? Why or why not? Please show your work.

6.) Michael is designing a corn maze for his grandfather's farm. The general shape of the corn maze is a quadrilateral. The perimeter of the corn maze is 1,221 feet. The top measures 381 feet. The bottom measures 227 feet. One of the sides measures 294 feet.

Determine the length of the other side. _____

Is this missing side shorter or longer than the other side? Please show your work to prove your answer.

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of MEASUREMENT

Objective: Determine the missing measure of a square or rectangle given the area using whole number dimensions.

The **area (A)** of a **rectangle or square** can be found by **multiplying the length (l) by the width (w)**. **A = l x w**
The **missing measure** of a square or rectangle can be determined by using **division**.

Examples:

$A = 64\ cm^2$

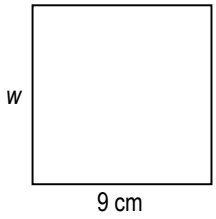
$A = l \times w$

$\frac{64}{16} = \frac{16}{16} \times w$

$4 = w$

The width of the rectangle is 4 cm.

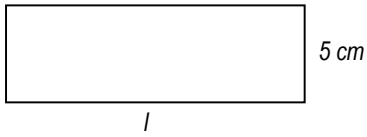
1.) Determine the missing side of the square. Please show your work.



$A = 81\ cm^2$

$w =$

2.) Determine the missing side of the rectangle. Please show your work.



$A = 65\ cm^2$

$l =$

3.) Determine the missing side of a rectangle with an area of 144 cm^2 and a width of 8 cm. Please show your work.

4.) Determine the missing side of a rectangle with an area of 480 cm^2 and a length of 32 cm. Please show your work.

5.) Marcus plans to paint a bright green rectangle on the bottom of his pool. He has enough paint to cover an area of 273 square feet. He wants the width of the rectangle to be 13 feet. Determine what the length of the rectangle should be. Please show your work.

6.) Brianna wants to put stickers, to celebrate her birthday, on top of chocolate bar wrappers. The bar is 48 mm wide and has an area of 4128 mm^2. What must be the length of the sticker to cover the top of the bar?

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of STATISTICS

Objective: Organize and display data to make frequency tables with no more than 5 categories or ranges of numbers and total frequencies of no more than 25.

Statistics involves collecting, organizing, analyzing, and presenting data.
Data are pieces of information that are often numerical.
Data can be **organized** in a **frequency table**, which shows the number of pieces of data that fall within given intervals.

Examples: The grades scored on a geometry quiz are shown in the table. Make a frequency table of the data.

Geometry Quiz Scores

99	83	92	52	75
90	99	65	80	85
53	80	75	85	85
70	75	90	95	75

Geometry Quiz Scores		
Scores	Tally	Frequency
51 – 60	II	2
61 – 70	II	2
71 – 80	𝍸 I	6
81 – 90	𝍸 I	6
91 - 100	IIII	4

1.) The owners of Donut Delight want to move their store to a new location. They asked their customers in which general direction they lived from the store. The data is shown in the table. Make a frequency table of the data.

Customer Locations

N	S	E	S	N	W
E	N	W	S	N	N
W	E	S	E	N	E
S	N	N	W	S	E

Customer Locations		
Direction	Tally	Frequency
North		
East		
South		
West		

2.) Ms. Wolf asked her students to name their favorite food. The data is shown in the table. Make a frequency table of the data.

Favorite foods

C	T	H	P	P	C
D	C	H	T	P	P
P	H	D	T	P	T
H	P	T	T	C	P

P = pizza T = taco H = hamburger
D =hot dog C = chicken

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of STATISTICS

Objective: Interpret frequency tables with no more than 5 categories or ranges of numbers and frequencies of no more than 25.

The **data** in a frequency table can be **analyzed and interpreted by comparing** the frequencies in each category.

Examples: Maria is counting three types of insects she finds under rocks in the park for an ecology survey. Her data is shown in the frequency table.

Insects Under a Rock		
Insects	Tally	Frequency
Beetle	𝍸 𝍸 𝍸 II	17
Earwig	𝍸 𝍸 𝍸 𝍸 I	21
Spider	𝍸 III	8

How many more Earwigs did Maria find than Beetles? **21 – 17 = 4 more Earwigs**

How many less spiders did Maria find than Beetles? **17 – 8 = 9 less Spiders**

In her report Maria is going to list the insects in order of most common to least common. What order should she write in her report? **Earwig (21), Beetle (17), Spider (8)**

1.) The frequency table shows the number of hours the band members in Mrs. Robinson's class practiced last week.

Practice Hours		
Hours	Tally	Frequency
0	II	2
1	𝍸 𝍸 𝍸 IIII	19
2	𝍸 𝍸 I	11
3	𝍸 II	7
4	III	3

How many students practiced more than 2 hours?

How many students practiced either 1 or 2 hours?

List the hours practiced from least common to most common.

2.) The frequency table shows Mr. Helta's students' favorite flavor if ice cream.

How many more students liked Chocolate than Chocolate Chip?

How many less students liked Strawberry than Chocolate and Vanilla?

The same amount of students liked Chocolate and Strawberry as did those who liked _____ and _____.

Favorite Flavors of Ice Cream		
Flavor	Tally	Frequency
Vanilla	𝍸 I	6
Chocolate	𝍸 IIII	9
Strawberry	I	1
Cookies 'n Cream	𝍸 𝍸 I	11
Chocolate Chip	IIII	4

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of STATISTICS
Objective: Organize and display the data for a given situation to make stem and leaf plots using no more than 20 data points and whole numbers.

In a **stem-and-leaf plot**, the **data is ordered from least to greatest** and is **organized by place value**.
The **digits** in the **left hand column** are the **stems**. Each **digit** on the **right** is called a **leaf**.
A **key** must be included that **explains the stems and leaves**.

Examples:

Money Earned Mowing Lawns ($)

60	55	53	41
67	72	65	68
65	70	52	51

Step 1: Order the data from least to greatest:
41 51 52 53 55 60 65 65 67 68 70 72

Step 2: Draw a vertical line and write the tens digit from least to greatest to the left of the line.

Step 3: Write the ones digits to the right of the line with the corresponding stems.

Step 4: Include a key that explains the stems and leaves.

Stem	Leaf
4	1
5	1 2 3 5
6	0 5 5 7 8
7	0 2

In this data set, the tens digits form the stems.

The ones digits of the data form the leaves.

Always write each leaf, even if it repeats

6 | 5 = $65

Key – it doesn't matter what #s you pick

1.) Make a stem-and-leaf plot for this data:
34 44 51 48 55 41 47 44 22 55 33

2.) Make a stem-and-leaf plot for this set of data:
$52 $49 $37 $21 $65 $49 $23 $51 $22 $21 $61

3.) Barbara counted the number of butterflies that visited her butterfly garden each hour. Make a stem-and-leaf plot of her data. 18 24 50 29 19 34 42 34 45 34 50 47

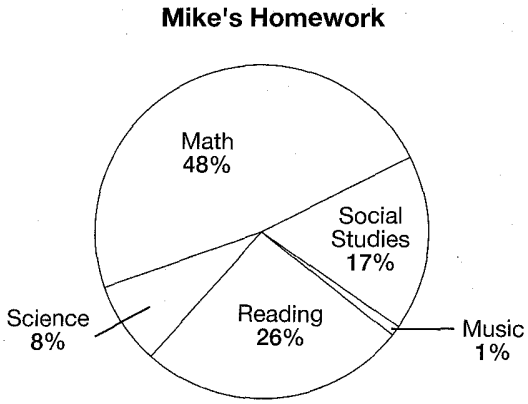
4.) Here are Ms. Corio's students' scores on their last math test. Make a stem-and-leaf plot of her data.
98 83 91 101 87 62 93 87 79 72 98 100 77 87 99

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of STATISTICS
Objective: Interpret circle graphs using no more than 5 categories and whole numbers or percents.

A **circle graph** is used to **compare parts of a whole**.

Examples:



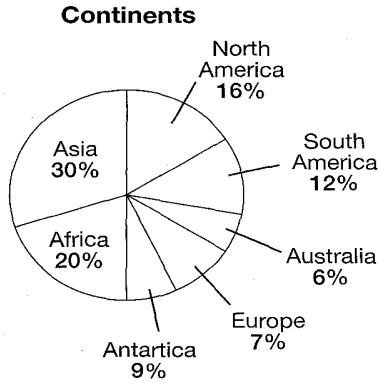
Which subject does Mike spend most of his time on? **Math**

How does the time spent on reading compare to the time spent on social studies? **26 – 17 = 9 He spends 9% more time on reading.**

On which subject does Mike spend almost as much time on as he does social studies and science combined? **17+ 8 = 25 Mike spends 26% on reading; almost equal to 25%.**

Mike's mom wants to know how he spends his homework time. Order the subjects from most time spent to least time spent. **Math, Reading, Social Studies, Science, Music**

1.) The circle graph show how much of the Earth's land each continent represents.



What continent has the greatest area?

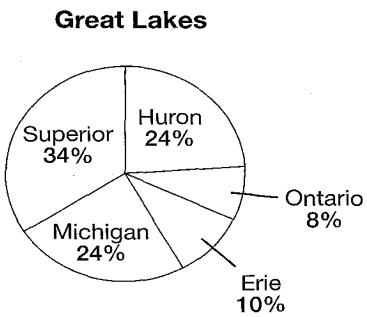
Which two continents are the smallest?

How does the size of Europe compare to the size of Africa?

How much larger is Asia than North America?

List the continents from smallest to largest.

2.) The circle graph shows how much of the total surface of the Great Lakes each lake takes up.



Which of the Great Lakes is the smallest?

Which two lakes are about the same size?

How does Lake Erie compare to Lake Ontario?

Which two lakes together are the same size as Lake Superior?

Which of the Great Lakes is the largest?

7th Grade - Summer Math Packet

Unit: KNOWLEDGE of STATISTICS

Objective: Determine the measures of central tendency (mean, median, and mode) and the range.

A number that helps **describe all of the data** in a data set is a **measure of central tendency**.
The **mean** is the sum of the data divided by the number of pieces of data.
The **median** is the middle number of the ordered data (least to greatest.)
The **mode** is the number or numbers that occur most often.
The **range** is the difference between the greatest and least values of the data set.

Examples:

Jacket Prices ($)			
25	34	39	41
45	52	27	22
56	61	15	27

Find the mean, median, mode, and range of the data.

$$\text{Mean} = \frac{25 + 34 + 39 + 41 + 45 + 52 + 27 + 22 + 56 + 61 + 15 + 27}{12}$$

$$= \frac{444}{12} = \mathbf{37}$$ The mean price of a jacket is $37.

Median = 15 22 25 27 27 34 39 41 45 52 56 61 (data ordered)

$$= \frac{34 + 39}{2} = \mathbf{36.5}$$ The median price of a jacket is $36.50.

Mode = **$27** because it is the only piece of data that occurs more than once.

Range = 61 – 15 = **$46**

1.) Find the mean, median, mode, and range for each set of data.

6, 9, 2, 4, 3, 6, 5

2.) Find the mean, median, mode, and range for each set of data.

13, 7, 17, 19, 7, 15, 11, 7, 21

3.) Find the mean, median, mode, and range for each set of data.

28, 32, 23, 43, 32, 27, 21, 34

4.) Find the mean, median, mode, and range for each set of data.

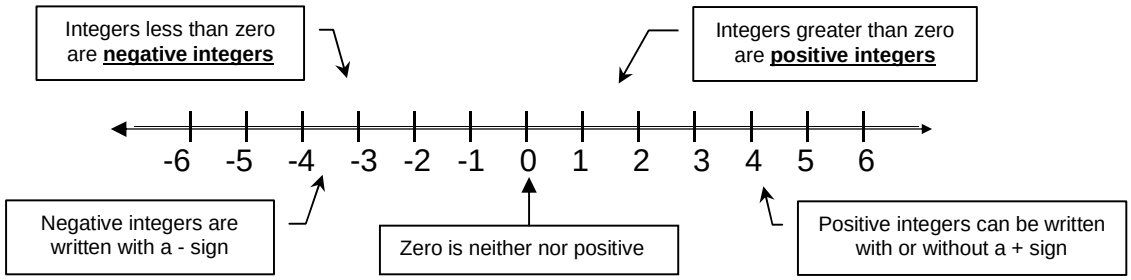
157, 124, 157, 124, 157, 139

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Read, write, and represent integers.

Examples:

Integer: Any number from the set {… -3,-2,-1,0,1,2,3…}



Write an integer to describe each situation

EX: a height increase of 3 inches
The word increase represents positive. The integer is 3 or +3.

EX: 50 feet below sea level
The word below represents negative. The integer is -50.

1.) Write an integer to describe: *The stock market increased 75 points*	**2.)** Write an integer to describe: *A loss of 15 yards*
3.) Write an integer to describe the situation: *Nancy owes her friend $10*	**4.)** Write an integer to describe: *Frederick is located 290 feet above sea level.*
5.) Write an integer to describe: *The temperature was 3° below zero*	**6.)** Write an integer to describe: *The 6th grade has 12 fewer students than last year*

7^{th} Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper **fractions** as **decimals**, percents, and ratios - **A**.

Examples: Write $\frac{21}{25}$ as a decimal

Method 1:

Change $\frac{21}{25}$ to a fraction with a denominator of 10, 100, or 1000

EX: $\frac{21}{25} = \frac{?}{100}$

(Use 100, since 25 divides into 100 evenly)

$\frac{21}{25} = \frac{x4}{x4} = \frac{84}{100}$ $\frac{84}{100} = 0.84$ as a decimal

Method 2: Divide 21 by 25

$\frac{21}{25} \rightarrow 25\overline{)21.00}$ $\frac{0.84}{}$

-200

100

-100

Therefore: $\frac{21}{25} = 0.84$

1.) Write $\frac{19}{20}$ as a decimal. Use method 1

2.) Write $\frac{7}{8}$ as a decimal. Use method 2.

3.) Write $\frac{3}{16}$ as a decimal. Use method 2

4.) Write $\frac{27}{40}$ as a decimal. Use method 2

5.) Write $\frac{3}{4}$ as a decimal. Use method 1

6.) Write $\frac{3}{5}$ as a decimal. Use method 1

7^{th} Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Identify and determine equivalent forms of proper **fractions** as decimals, **percents**, and ratios - **B**.

Key Concept: Percent (%) is a ratio that compares a number to **100**

Fraction to Percent:

EX: Change $\frac{19}{25}$ to a percent

Since % means out of 100, $\frac{19}{25} = \frac{?}{100}$

$\frac{19}{25} = \frac{x4}{x4} = \frac{76}{100}$

$\frac{76}{100} = 76\%$

Percent to fraction:

EX: Change 75% to a fraction in simplest form

75% means *75 out of 100*

$75\% = \frac{75}{100}$ **Write the percent as a fraction with a denominator of 100**

$\frac{75}{100} \frac{\div 25}{\div 25} = \frac{3}{4}$ **Simplify**

1.) Change $\frac{17}{20}$ to a percent

2.) Change 84% to a fraction in simplest form

3.) Change $\frac{3}{4}$ to a percent

4.) Change 90% to a fraction in simplest form

5.) Juan answered $\frac{24}{25}$ questions correctly on his quiz. What percent of the questions did he get correct?

6.) 78% of the class completed their homework last night. What fraction of the class completed their homework?

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Identify and determine equivalent forms of proper **fractions** as decimals, percents, and **ratios** - **C**.

Key Concept: Ratio: a comparison of two numbers
A ratio can be written in 3 ways: a:b
a to b **or**
$\frac{a}{b}$

EX: Write the ratio as a fraction simplest form: **4 wins to 6 losses**

Since the ratio can be written as: $\frac{4}{6}$ **we can the simplify to** $\frac{2}{3}$ or 2:3 or 2 to 3

1.) Write the ratio as a fraction simplest form: **12 boys to 15 girls**	**2.)** Write the ratio as a fraction simplest form: **20 books to 24 magazines**
3.) Write the ratio as a fraction simplest form: **10 circles to 15 triangles**	**4.)** Write the ratio as a fraction simplest form: **8 cups to 2 servings**
5.) Write the ratio as a fraction simplest form: **50 cars to 100 trucks**	**6.)** Write the ratio as a fraction simplest form: **9 pencils to 11 pens**

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Compare and order fractions and decimals.

Ordering fractions only:

1) determine the least common denominator (LCD) of the fractions
2) rewrite each fraction as an equivalent fraction using the LCD
3) Compare the numerators

EX: order the fractions $\frac{1}{2};\frac{3}{8};\frac{7}{12}$ **from least to greatest**

1) **LCD of 2, 8, and 12 is 24**
2) $\frac{1}{2}=\frac{12}{24}$
   $\frac{3}{8}=\frac{9}{24}$
   $\frac{7}{12}=\frac{14}{24}$
3) **Comparing the numerators:**
   $\frac{3}{8}<\frac{1}{2}<\frac{7}{12}$

Ordering fractions and decimals:

1) Change the fractions to decimals
2) Compare the decimals

EX: order the numbers 0.3; $\frac{3}{8}$; and 0.38 **from least to greatest**

1) $\frac{3}{8}=0.375$
   $\frac{3}{8}=\frac{9}{24}$
   $\frac{7}{12}=\frac{14}{24}$

$$\begin{array}{r} 0.375 \\ 8\overline{)3.000} \\ \underline{-24} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \end{array}$$

2) **Compare the decimals:**
   0.3 < 0.375 < 0.38

Therefore: $0.3<\frac{3}{8}<0.38$

1.)
Order the fractions $\frac{2}{3};\frac{5}{6};\frac{3}{4}$ from least to greatest

2.)
Order the numbers 0.78; $\frac{3}{4}$; and 0. 8 from least to greatest

3.)
Order the fractions $\frac{3}{5};\frac{7}{10};\frac{5}{6}$ from least to greatest

4.)
Order the numbers $\frac{3}{10}$; $\frac{1}{5}$; and 0.25 from least to greatest

5.)
Order the fractions $\frac{1}{2};\frac{5}{9};\frac{5}{6}$ from least to greatest

6.)
Which number has the greatest value? 0.94; $\frac{19}{20}$; or $\frac{24}{25}$

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Add and subtract fractions and mixed numbers and express answers in simplest form.

Adding and Subtracting Fractions:

1) determine the least common denominator (LCD) of the fractions
2) rewrite each fraction as an equivalent fraction using the LCD
3) Add or subtract the fractions
4) Simplify if necessary

EX: Add $\frac{1}{2}+\frac{3}{8}$

1) **LCD of 2 and 8 is 8**
2) $\frac{1}{2}=\frac{4}{8}$
   $+\frac{3}{8}=\frac{3}{8}$
3) $\frac{7}{8}$
4) (can't be simplified)

EX: Subtract $3\frac{3}{5}-1\frac{1}{6}$

1) **LCD of 5 and 6 is 30**
2) $3\frac{3}{5}=3\frac{18}{30}$
   $-1\frac{1}{6}=-1\frac{5}{30}$
3) $2\frac{13}{30}$
4) (can't be simplified)

1.) $\frac{4}{6}+\frac{1}{3}=$

2.) $\frac{11}{12}-\frac{5}{8}=$

3.) $1\frac{3}{8}+2\frac{3}{4}=$

4.) $3\frac{5}{6}-1\frac{4}{5}=$

5.) Shelly has two pieces of yarn. One is $1\frac{1}{2}$ yards long and the other is $2\frac{3}{4}$ yards long. How much yarn does she have altogether?

6.) Marty weighs 64 ¼ pounds and Nathan weighs 76 ½ pounds. How much more does Nathan weigh than Marty?

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Multiply fractions and mixed numbers and express answers in simplest form.

Multiplying Fractions and Mixed Numbers:

1) Change Mixed numbers to improper fractions
2) Multiply numerators
3) Multiply denominators
4) Simplify if necessary

EX: multiply $\frac{1}{2}\times\frac{3}{8}$

1) **No mixed numbers**
2) $\frac{1}{2}\times\frac{3}{8}=\frac{3}{\ }$
3) $\frac{1}{2}\times\frac{3}{8}=\frac{3}{16}$
4) (can't be simplified)

EX: Multiply $\frac{1}{3}\times 6\frac{3}{7}$

1) $6\frac{3}{7}=\frac{45}{7}$ as an improper fraction
2) $\frac{1}{3}\times\frac{45}{7}=\frac{45}{\ }$
3) $\frac{1}{3}\times\frac{45}{7}=\frac{45}{21}$
4) Simplified: $\frac{45}{7}=2\frac{1}{7}$

1.) $\frac{5}{6}\times\frac{1}{2}=$

2.) $\frac{9}{10}\times\frac{2}{3}=$

3.) $2\frac{1}{2}\times 1\frac{2}{5}=$

4.) $2\frac{1}{4}\times 3\frac{1}{3}=$

5.) Belinda lives 1 ½ times further from school than Jamie does. If Jamie lives 4 1/5 miles from school, how far does Belinda live?

6.) Mario practices his guitar every day for ¾ of an hour. How long does he practice for week?

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Multiply decimals.

Examples: Multiply 3.4 X 1.2

3.4
X 1.2
6 8 ← **multiply 34 by 2 (ignore the decimal point)**
+ 3 4 0 ← **multiply 34 by 10 (the 1 is in the tens place)**
4 0 8 ← **add 68 and 340**

Count the number of decimal places in the original problem. Since there are 2 total decimal places, the answer should also have 2 decimal places.

3.4 (1 decimal place)
X 1.2 (1 decimal place)
4.08 2 total decimal places

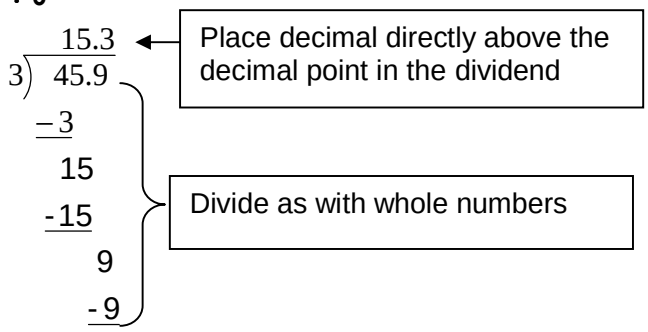
Answer 4.08

1.) 1.2 X 0.5	**2.)** 3.3 X 4.6
3.) 0.4 X 0.6	**4.)** 7.89 X 5
5.) Turkey cost $5.79 a pound. How much will 2.9 pounds of turkey cost? Round to the nearest cent.	**6.)** Ralph bought 6 CDs at a cost of 17.75 each. How much did the CDs cost altogether?

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Divide decimals.

Example: Divide 45.9 ÷ 3



1.)

$4\overline{)12.5}$

2.)

$5\overline{)32.12}$

3.) 215 ÷ 10

4.) 3 ÷8

5.) Maria and two of her friends shared the cost of their lunch. If the lunch cost $15.90, how much would each one have to pay?

6.) If seven oranges cost $4.13, how much would one orange cost?

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Determine 10, 20, 25, or 50 percent of a whole number.

Example: Determine 25% of 40

Method 1:
Change the percent to a fraction and multiply

25%= ¼

$\frac{1}{4} \times 40 = 10$

Therefore 25% of 40 is 10.

Method 2:
Change the percent to a decimal and multiply

25%= 0.25

0.25 X 40 = 10.00

Therefore 25% of 40 is 10.

$$\begin{array}{r} 40 \\ \underline{\text{X } 0.25} \\ 200 \\ \underline{+800} \\ 10.00 \end{array}$$

1.) Determine 20% of 65.

2.) Determine 50% of 120.

3.) Determine 25% of 20.

4.) Determine 10% of 35.

5.) 20% of the 250 students ate pizza for lunch. How many students ate pizza?

6.) Nia saved 10% on her CD purchase. If the CD originally cost $24.90, how much did she save?

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Use the distributive property to simplify numeric expressions using whole numbers.

Examples: 42 X 5 = (40X5) + (2X5)
42 = 40+2

1.)
Which of these expressions is equivalent to 15 x 28?

a) (15 x 20) + (15 x 8)

b) (15 x 8) + (28 x 10)

c) (15 x 10) + (28 x 10)

d) (28 x 15) + (10 x 10)

2.)
Which of these expressions is equivalent to 31 x 14?

a) (10 x 30) + (4 x 1)

b) (14 x 1) + (14 x 30)

c) (10 x 1) + (30 x 4)

d) (30 x 14) + (10 x 14)

3.)
Which of these expressions is **NOT** equivalent to 21 x 13?

a) (13 x 20) + (13 x 1)

b) (21 x 10) + (21 x 3)

c) (30 x 13) – (9 x 13)

d) (20 x 10) + (1 x 3)

4.)
Which of these expressions is **NOT** equivalent to 37 x 21?

a) (21 x 30) + (21 x 7)

b) (30 x 20) + (7 x 1)

c) (40 x 21) – (3 x 21)

d) (37 x 20) + (37 x 1)

5.)
Which of these expressions is equivalent to 34 x 12?

a) (30 x 10) + (4 x 2)

b) (34 x 10) + (34 x 12)

c) (30 x 12) + (4 x 12)

d) (30 x 12) - (4 x 12)

6.)
Which of these expressions is **NOT** equivalent to 49 x 19?

a) (40 x 19) + (9 x 19)

b) (49 x 20) - (49 x 1)

c) (50 x 19) – (1 x 19)

d) (49 x 10) + (9 x 9)

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Estimate to determine the product of a decimal and a whole number

Example: Multiply 6.45 X 7

1. Round to the nearest whole numbers. **6.45 rounds to 6**
Since 7 is already a whole number, it stays the same.

2. Multiply the rounded numbers **6 X 7**

3. Answer **42**

Estimate each of the following multiplication problems. Round all decimals to the nearest whole number.

1.) 6 X 1.65	**2.) 0.82 X 4**
3.) 3 X 9.95	**4.) 12.9 X 7**
5.) Three pairs of shoes are priced at $39.95 each. Estimate the total cost for the all 3 pairs of shoes.	**6.) If you work 6 hours at $6.35 an hour, estimate how much you would make?**

7th Grade - Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION
Objective: Estimate to determine the quotient of a decimal.

Example: Divide 45.9 ÷ 10

1. **Estimate to the nearest tens.**
   45.9 rounds to 50
   10 stays the same
2. **Divide with estimated numbers.**
3. **Answer**.

$$10\overline{)50}$$

5

Estimate each of the following division problems. Round all numbers to the nearest ten.

1.)

$$35\overline{)196.5}$$

2.)

$$14\overline{)37.1}$$

3.) 7.49 ÷ 14

4.) 89.904 ÷34

5.) Maria and twelve of her friends shared the cost of their lunch. If the lunch cost $75.90, estimate how much would each one have to pay?

6.) Brianna and 15 of her friends bought sodas after their lacrosse game. If the drinks cost $43.29, estimate how much each person would owe if the cost is divided equally?