Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Complete a function table with a given two operation rule.
Examples:

> The solution of an equation with two variables consists of two numbers, one for each variable, that make the equation true. The solution is usually written as an ordered pair.

The cost to rent a bicycle at the beach includes a rental fee of 5 dollars plus 3 dollars for each hour. The equation for the cost of renting a bicycle is:

$$C = 3H + 5$$

C is the total cost and H is the number of hours.

Bicycle Rentals		
Hours	3H + 5	Cost (dollars)
1	3(1) + 5	8
2	3(2) + 5	11
3	3(3) + 5	14
4	3(4) + 5	17

Complete the following tables:

1.)

C = 3H + 4

H	3H + 4	C
2	3(2) + 4	
4		
6		
10		

2.)

Y = 5X + 2

X	5X + 2	Y
3		
6		
9		
12		

3.)

Y = 5X - 3

X	5X - 3	Y
1	5(1) - 3	2
2		
3		
4		

4.)

A = 4B - 3

B	4B - 3	A
3		
4		
5		
6		

5.)

Y = 2 + 10X

X	2 + 10X	Y
3	2 + 10(3)	32
4		
5		

6.)

6B – 1 = A

B	6B – 1	A
8	6(8) – 1	47
10		
12		

Unit: Knowledge of Algebra, Patterns, and Functions

Objective: Evaluate numeric expressions using order of operations with no more than 4 operations.

> **Use the order of operations to evaluate numerical expressions.**
> 1. Do all operations within grouping symbols first.
> 2. Evaluate all powers before other operations.
> 3. Multiply and divide in order from left to right.
> 4. Add and subtract in order from left to right.

Example 1: Evaluate $14 + 3(7 - 2) - 2 \cdot 5$

$14 + 3(7 - 2) - 2 \cdot 5$
$= 14 + 3(5) - 2 \cdot 5$ Subtract first since 7 – 2 is in parentheses
$= 14 + 15 - 2 \cdot 5$ Multiply left to right, 3 • 5 = 15
$= 14 + 15 - 10$ Multiply left to right, 2 • 5 = 10
$= 29 - 10$ Add left to right, 14 + 15 = 29
$= 19$ Subtract 10 from 29

Example 2: $8 + (1 + 5)^2 \div 4$

$8 + (1 + 5)^2 \div 4$
$= 8 + (6)^2 \div 4$ Add first since 1 + 5 is in parentheses
$= 8 + 36 \div 4$ Find the value of 6^2
$= 8 + 9$ Divide 36 by 4
$= 17$ Add 8 and 9

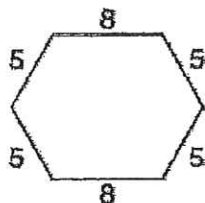Evaluate each of the following. Show each step!

|	
1.) $(2 + 10)^2 \div 4$	2.) $(6 + 5) \cdot (8 - 6)$
3.) $72 \div 3 - 5(2.8) + 9$	4.) $3 \cdot 14(10 - 8) - 60$
5.) The perimeter of a hexagon is found by adding the lengths of all six sides of the hexagon. For the hexagon below write a numerical expression to find the perimeter. Then evaluate the expression.	6.) Without parentheses, the expression $8 + 30 \div 2 + 4$ equals 27. Place parentheses in the expression so that it equals 13; then 23.

Unit: Knowledge of Algebra, Patterns, and Functions

Objective: Apply given formulas to a problem-solving situation using formulas having no more than three variables.

Example 1:

The perimeter of a rectangle is twice the length (L) plus twice the width (W). **P = 2L + 2W**

Use the given formula to find the perimeter of the rectangle.

8 cm
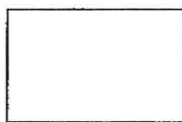
10 cm

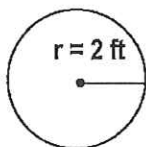|	
P = 2L + 2W	Write the equation
P = 2(10) + 2(8)	Replace L and W with the length and width
P = 20 + 16	Multiply
P = 36 cm	Simplify and add the correct label

Example 2:

The area A of a circle equals the product of pi (π) and the square of its radius (r). $A = \pi r^2$ ($\pi \approx 3.14$)

Use the given formula to find the area of the circle.

r = 2 ft

$A = \pi r^2$	Write the equation
$A = 3.14 \cdot (2)^2$	Replace π with 3.14 and r with 2
$A = 3.14 \cdot 4$	Square the 2
$A = 12.56$ ft²	Simplify and add the correct label

1.) The formula for finding the area of a rectangle is **A = L • W**. Use this formula to find the area of the rectangle.
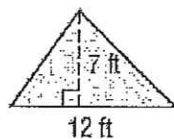
9 cm

4 cm

2.) The formula for finding the area of a triangle is $A = \dfrac{1}{2} bh$. Find the area of the triangle below.
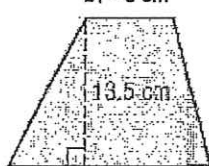
7 ft

12 ft

3.) A trapezoid has two bases (b₁ and b₂). The formula for finding the area of a trapezoid is: $A = \dfrac{1}{2}h(b_1 + b_2)$

b₁ = 8 cm

Find the area of the trapezoid.

13.5 cm

b₂ = 18 cm

4.) The formula for finding the volume of a rectangular prism is **V = L • W • H**. Find the volume of the box.

L = 12 in.

H = 7 in.

W = 5 in.

5.) Margot planted a rectangular garden that was 18 feet long and 10 feet wide. How many feet of fencing will she need to go all the way around the garden? **P = 2L + 2W**

6.) Juan ran all the way around a circular track one time. The diameter (d) of the track is 60 meters. The formula for circumference of a circle is **C = πd**. Use this formula to find out how far Juan ran.

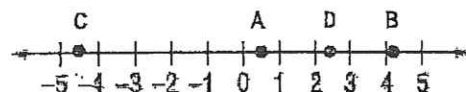Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Graph rational numbers on a number line.

Rational Numbers are numbers that can be written as fractions.
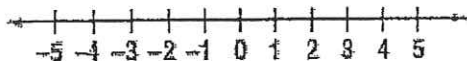Some examples of rational numbers are ½ , 5 ¾ , 0.8, and -1.4444...

Example: Graph and label the following numbers on the number line:
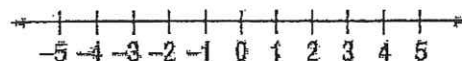
A: $\dfrac{1}{2}$ B: $4\dfrac{1}{4}$ C: -4.5   D: 2.5

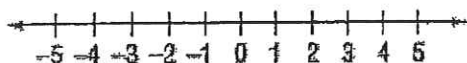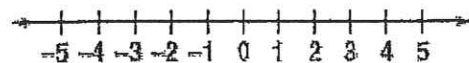| 1.) Graph and label the following numbers on the number line.	2.) Graph and label the following numbers on the number line.
A: –5 B: –1 C: 2 D: 5	A: 0 B: $-1\dfrac{1}{2}$ C: $\dfrac{5}{2}$ D: 4
3.) Graph and label the following numbers on the number line.	4.) Graph and label the following numbers on the number line.
A: 1.5 B: –0.5 C: –3.5 D: 3.5	A: $-\dfrac{9}{3}$ B: $-\dfrac{3}{2}$ C: $\dfrac{9}{4}$ D: $\dfrac{12}{3}$

5.) Jonah recorded the temperature for 5 days on a chart. Draw a number line and graph the temperatures. Where do the numbers on the line need to begin and end? Label the points 1 to 5.

Day 1	Day 2	Day 3	Day 4	Day 5
45°	50°	53°	57°	60°

6.) Graphing numbers on a number line can help you put them in order from smallest to greatest. Draw a number line and graph the numbers in the chart below. Label the points. Which number is the smallest?

V	W	X	Y	Z
20	–10	–15	5	10

4

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Graph ordered pairs in a coordinate plane.

> The **coordinate plane** is used to locate points. The horizontal number line is the **x-axis**. The vertical number line is the **y-axis**. Their intersection is the **origin**.
> Points are located using **ordered pairs**. The first number in an ordered pair is the **x-coordinate**; the second number is the **y-coordinate**.
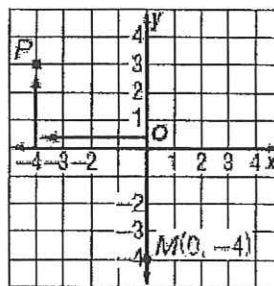> The coordinate plane is separated into four sections called **quadrants**.

Example 1: Name the ordered pair for point P. Then identify the quadrant in which P lies.
- Start at the origin.
- Move 4 units left along the x-axis.
- Move 3 units up on the y-axis.

The ordered pair for point P is (- 4, 3).
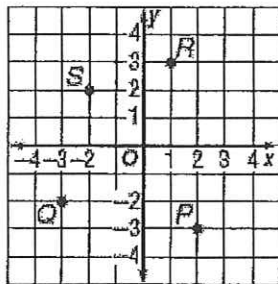P is in the upper left quadrant or quadrant II.

Example 2: Graph and label the point M (0, - 4).
- Start at the origin.
- Move 0 units along the x-axis.
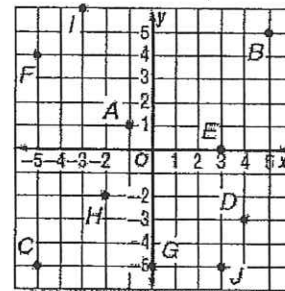- Move 4 units down on the y-axis.
- Draw a dot and label it M(0, - 4).

1.) Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.

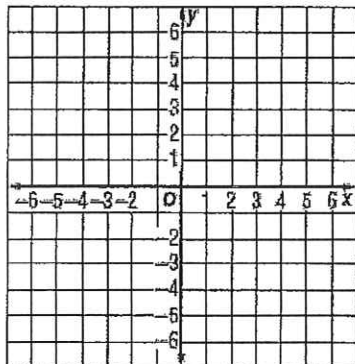|	Coordinates	Quadrant
P	(___ , ___)	___
Q	(___ , ___)	___
R	(___ , ___)	___
S	(___ , ___)	___

2.) Find each of the points below on the coordinate plane. Then identify the quadrant in which each point lies.

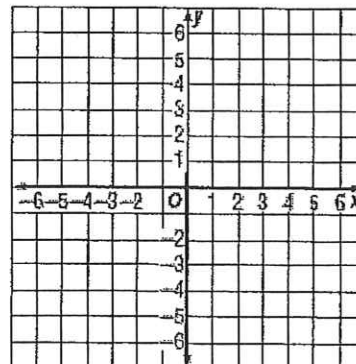|	Coordinates	Quadrant
A	(___ , ___)	___
J	(___ , ___)	___
B	(___ , ___)	___
H	(___ , ___)	___

3.) Graph and label each point on the coordinate plane.

N (3, -1)

P (-2, 4)

Q (-3, -4)

R (0, 0)

S (-5, 0)

4.) Graph and label each point on the coordinate plane.

D (0, 4)

E (5, 5)

G (-3, 0)

H (-6, -2)

J (0, -2)
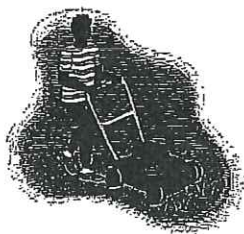
5

Unit: Knowledge of Algebra, Patterns, and Functions

Objective: Identify and describe the change represented in a table of values; identify increase, decrease, or no change.

Example: Look at the table below. How are Wages (y) affected by the number of Hours Worked (x)?
Identify the change as **increasing,** decreasing, or **no change.** Describe the changes in y-values.

Hours Worked (x)	Wages (y)
2	$14
4	$28
6	$42
8	$56
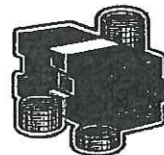
As the Hours Worked (x) increase, the wages (y) increase.
Wages increase by $14 dollars for every 2 hours worked (or $7 for every hour worked).

Identify the change in each table of values as **increasing,** decreasing, or no change. Describe the changes in y-values.

1.)

Homework Minutes (x)	Test Grades (y)
25	61
35	74
45	87
55	100

2.)

Time Hours (x)	Distance Miles (y)
1	50
2	100
3	150
4	200

3.)

Temperature (x)	Dewpoint (y)
68°	1.9°
76°	1.3°
91°	0.7°
104°	0.1°

4.)

Cell Phone Plan Minutes (x)	Cost (y)
625	$59.99
723	$59.99
829	$59.99
899	$59.99

5.)

Month (x)	Fee ($) (y)
1	22
2	44
3	66
4	88

6.)

Oil changes per year (x)	Cost of Car Repairs $ (y)
0	1000
1	700
2	400
3	100

Unit: Knowledge of Geometry

Objective: Identify and describe angles formed by intersecting lines, rays, or line segments - **A**

An **angle** is formed by two rays with a common vertex.
Angles are also formed by intersecting lines or line segments.
Angles are measured in **degrees**.
Angles are classified according to their measures.

Vertex
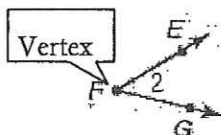
∠2 (also called ∠EFG)

is formed by rays FE and FG

Right Angle	Acute Angle	Obtuse Angle	Straight Angle
exactly 90°	less than 90°	between 90° and 180°	exactly 180°

1.) Classify the angle as **acute, obtuse, right,** or **straight.**

M
N   O
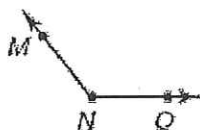
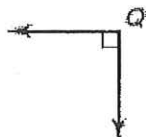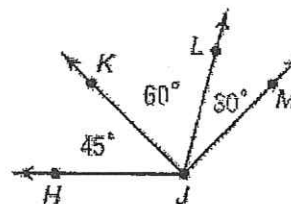**2.)** Classify the angle as **acute, obtuse, right,** or **straight.**

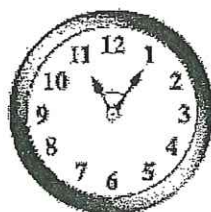---

3.) Classify the angle as **acute, obtuse, right,** or **straight.**

Q

4.) Name all of the acute angles.

K   L
60°   30°   M
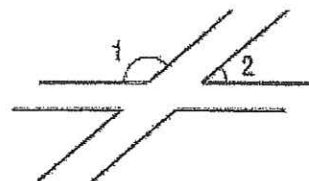45°
H   J

5.) The time shown on the clock is 11:05. Starting at this time, approximately what time will it be when the hands form an obtuse angle?

6.) The runways at a local airport are sketched in the figure. Classify ∠1 and ∠2 as acute, obtuse, right, or straight.
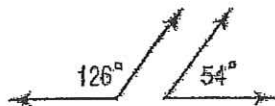
1   2

7

Unit: Knowledge of Geometry

Objective: Identify and describe angles formed by intersecting lines, rays, or line segments - B

Examples:

When two lines intersect, they form two pairs of opposite angles called **vertical angles**, which are always congruent.

Congruent angles have the same measure.

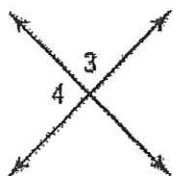$\angle 1 \cong \angle 2$ means that angle 1 is congruent to angle 2.

Two angle are **supplementary** if the sum of their measures is 180°.

$126° + 54° = 180°$
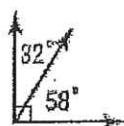
Two angles are **complementary** if the sum of their measures is 90°.

$32° + 58° = 90°$

1.) Classify the angles as complementary, supplementary, or neither.	2.) Classify the angles as **complementary**, supplementary, or **neither**.
3.) Classify the angles as complementary, supplementary, or neither.	4.) Classify the angles as complementary, supplementary, or neither.
5.) A map shows a railroad crossing a highway, as shown below. Which of the numbered angles are vertical angles?	6.) In a game of pick-up-sticks, the last 4 sticks are shown below. Which of the numbered angles are vertical angles?
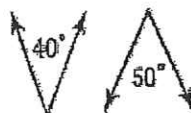
8

Unit: Knowledge of Geometry

Objective: Determine a missing angle using the sum of the interior angles in a quadrilateral

Examples of Quadrilaterals:

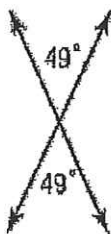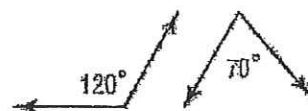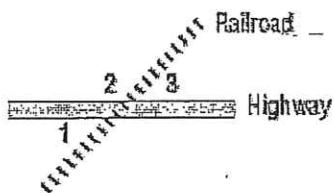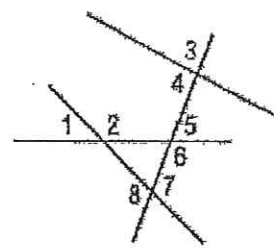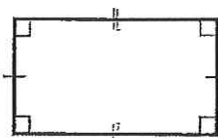| Parallelogram | Rectangle | Square | Rhombus | Trapezoid |
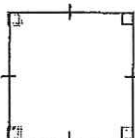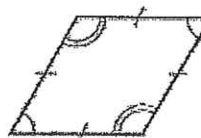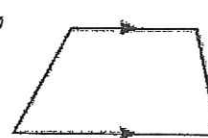
The sum of the measures of the angles of a quadrilateral is 360°

$$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 = 360°$$
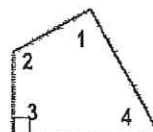
Example: Find the missing measure in the quadrilateral.
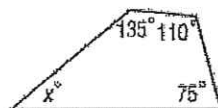
$135 + 110 + 75 + x = 360$ The sum of the measures is 360°

$320 + x = 360$ **Simplify**

$\underline{-320 \quad\quad -320}$ Subtract 320 from each side

$x = 40$ The missing angle is 40°

Find the missing measure in each of the following quadrilaterals.

1.)

135° x°
45°   88°

2.)

x° 72°
82° 95°

3.)

54°
125°
x° 96°

4.)

121°
72° x°
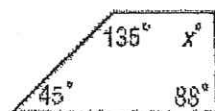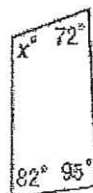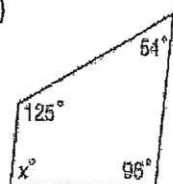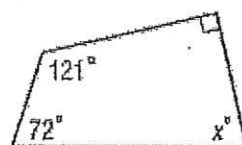
5.) The top of Mrs. Hartsock's coffee table is shown below. Find the measure of the missing angle.

x°
60°
120° 100°
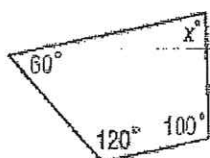
6.) Maria needs to cut a piece of carpet to fit the space drawn below. What should the measure of the missing angle be?

x°
64°
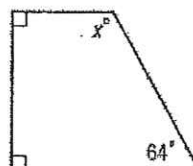
Unit: Knowledge of Geometry

Objective: Determine the congruent parts of polygons.
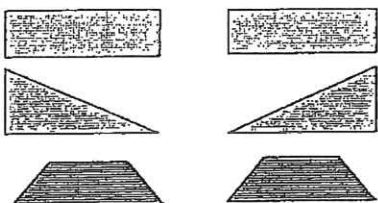
Congruent Polygons   Non Congruent Polygons
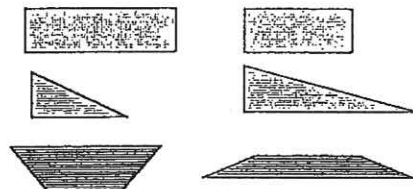
Congruent Polygons	Polygons that have exactly the same size and the same shape
Congruent Segments	Segments that have the same length
Congruent Angles	Angles that have the same measure
Corresponding Sides of a Polygon	Sides of a polygon that are matched up with sides of another congruent or similar polygon
Corresponding Angles of a Polygon	Angles of a polygon that match up with angles of another congruent or similar polygon
$\triangle ABC \equiv \triangle DEF$	Corresponding sides and angles of congruent polygons are congruent:

A 3cm, B 7cm C D 3cm, E 7cm F

$\overline{AB} \equiv \overline{DE}$ $\angle A \equiv \angle D$
$\overline{BC} \equiv \overline{EF}$ $\angle B \equiv \angle E$
$\overline{AC} \equiv \overline{DF}$ $\angle C \equiv \angle F$

1.)

G 5cm H, 4cm, F, 8cm, 45° J   L y M, K z, 8cm, N x
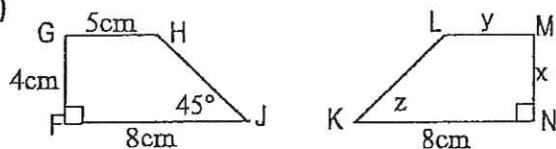
Polygon FGHJ $\equiv$ polygon NMLK
Complete the following congruence statements.

$\overline{GH} \equiv$ _____ $\overline{KL} \equiv$ _____ $\overline{IJ} \equiv$ _____

2.) Use the figures in problem #1 to complete the following congruence statements.

$\angle G \equiv$ _____ $\angle K \equiv$ _____

$\angle H \equiv$ _____ $\angle F \equiv$ _____

3.) Look at the figures in problem #1. Determine the measure of each segment or angle.

x = _____   y = _____   z = _____

4.) Polygon HJKLMNPQ is congruent to polygon RSTUVXYZ. What is the length, in units, of $\overline{RZ}$? (Note: Figures are not drawn to scale.)

H 120 J, P, Q, 60, N 80, M, 60, L 80 K, 160

S T, V, U, R Z, Y X, 160
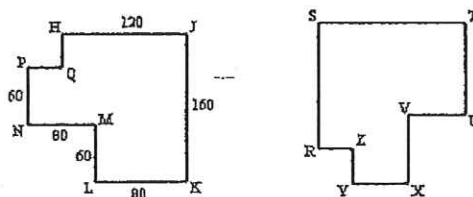
Unit: Knowledge of Statistics

Objective: Compare the measures of central tendency (mean, median, mode) to determine which is most appropriate.

Examples:

	MEAN	MEDIAN	MODE
What is it?	Average	Middle #	# shown the MOST often
How to find it?	Sum of Data (+) / # of Data Points (÷)	Order data from least to greatest, then find the middle # 2 middle #s - Average	Look at data & Find the # that appears the most. 2 modes – Bimodal
Most Useful when:	-- Data has no outliers Outliers are REALLY low & high #s	-- Data has outliers -- There are no large gaps in the middle of the data	-- Data has many identical (same) #s

Use the table at the right.

Find the mean, median, & mode of the data.

Mean: 488.3
Median: 150
Mode: None

Caribbean Islands			
Island	Area (Sq Mi)	Island	Area (Sq Mi)
Antiqua	108	Martinique	425
Aruba	75	Puerto Rico	3,339
Barbados	166	Tobago	116
Curacao	171	Virgin Islands, UL	59
Dominica	290	Virgin Islands, US	134

Which measure of central tendency would be misleading in describing the size of the islands? Explain.
The mean could be misleading since the areas of all but one of the islands are less than that value.
Which measure would most accurately describe the data? Median

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Use the table that shows the miles of shoreline for five states to answer questions 1 – 3.

Miles of Shoreline	
State	Length of Shoreline (mi)
Virginia	3,315
Maryland	3,190
Washington	3,026
North Carolina	3,375
Pennsylvania	89

1.) Determine the mean, median, and mode of the data.

2.) Which measure of central tendency is misleading in describing the miles of shoreline for the states? Explain.

3.) Which measure of central tendency most accurately describes the data? Explain.

Book Sales: Use the table below that shows the number of books sold each day for 20 days to answer questions 3 – 5.

Book Sales Per Day			
23	18	23	15
24	16	0	11
19	10	13	17
12	23	11	16
36	24	12	27

4.) Determine the mean, median, & mode of the data.

5.) Which measure of central tendency would be misleading in describing the book sales & which measure most accurately describes the data? Explain.

6.) Michael & Melissa both claim to be earning a C average, 70% to 79%, in their Latin Class. Use the table below to explain their reasoning and determine which student is earning a C average.

GRADES (%)	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
Michael	80	76	73	70	40	25	10
Melissa	88	83	75	70	60	65	62

Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, multiply and divide integers. - A
Examples:
ADDITION INTEGER RULES:
   For integers with the same sign:
   • The sum of two positive integers is POSITIVE.
   • The sum of two negative integers is NEGATIVE.
   For integers with different signs, subtract their absolute value. The sum is:
   • Positive IF the positive integer has the greater absolute value.
   • Negative IF the negative integers has the greater absolute value.

Examples:
   $-6 + (-3) =$ add keep the sign $= -9$ $-34 + (-21) =$ add keep the sign $= -55$

   $8 + (-7) =$ subtract keep the sign of the higher $= 1$ $-5 + 4 =$ subtract keep the sign of the higher $= -1$

SUBTRACTION INTEGER RULES:
   • Keep the first number the same
   • Switch the subtraction sign to ADDITION
   • Change the second number to it's opposite. Opposite: -6 to 6
   • Follow Addition rules above.

Examples:
   $6 - 9 = 6 + (-9) = -3$ $-10 - (-12) = -10 + 12 = 2$

   $-3 - 7 = -3 + (-7) = -10$ $1 - (-2) = 1 + 2 = 3$

1.) Add: $2 + (-7)$	2.) Subtract: $-13 - 8$
3.) Evaluate $a - b$ if $a = -2$ and $b = -7$	4.) Evaluate $x + y + z$ if $x = 3$, $y = -5$, and $z = -2$
5.) In Mongolia the temperature can dip down to $-45°$ C in January. The temperature in July may reach $40°$ C. What is the temperature range in Mongolia?	6.) Write an addition expression to describe skateboarding situation. Then determine the sum. Hank starts at the bottom of a half pipe 6 feet below street level. He rises 14 feet at the top of his kickturn.

Unit: Knowledge of Number Relationships & Computation

Objective: Add, subtract, multiply and divide integers. - B

Examples:

MULTIPLYING & DIVIDING INTEGER RULES:
- Two integers with DIFFERENT signs the answer is NEGATIVE.
- Two integers with SAME signs the answer is POSITIVE.

Examples:

5 (- 2) = 5 times – 2, the signs are different so the answer will be negative = - 10

(- 6) • (- 9) = the signs are the same so the answer will be positive = 54

30 ÷ (- 5) = the signs are different so the answer will be negative = - 6

- 100 ÷ (- 5) = the signs are the same so the answer will be positive = 20

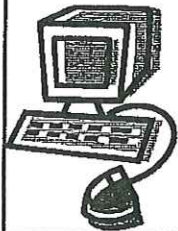|	
1.) Mulitply: - 14 (- 7)	2.) Divide: 350 ÷ (- 25)
3.) Evaluate if a = - 3 and c = 5 - 3ac	4.) Evaluate if d = - 24, e = - 4, and f = 8 $$\dfrac{de}{f}$$
5.) A computer stock decreased 2 points each hour for 6 hours. Determine the total change in the stock value over the 6 hours.	6.) A submarine descends at a rate of 60 feet each minute. How long will it take it to descend to a depth of 660 feet below the surface?

Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, and multiply positive fractions and mixed numbers. - A
Examples:
- To add unlike fractions (fractions with different denominators), rename the fractions so there is a common denominator.

Add: $\frac{1}{6} + \frac{2}{5} =$ $\frac{1}{6} = \frac{1 \times 5}{6 \times 5} = \frac{5}{30}$ $\frac{2}{5} = \frac{2 \times 6}{5 \times 6} = \frac{12}{30}$ $\frac{5}{30} + \frac{12}{30} = \frac{17}{30}$

Add: $12\frac{1}{2} + 8\frac{2}{3} =$ $12\frac{1}{2} = 12\frac{1 \times 3}{2 \times 3} = 12\frac{3}{6}$ $8\frac{2}{3} = 8\frac{2 \times 2}{3 \times 2} = 8\frac{4}{6}$

$12\frac{3}{6} + 8\frac{4}{6} = 20\frac{7}{6}$ $\frac{7}{6}$ is improper so we must change it to proper.   7 divided by 6 $= 1\frac{1}{6}$

$20 + 1\frac{1}{6} = 21\frac{1}{6}$

1.) Add: $\frac{1}{3} + \frac{1}{9}$	2.) Add: $7\frac{4}{9} + 10\frac{2}{9}$
3.) Add: $1\frac{5}{9} + 4\frac{1}{6}$	4.) Add: $2\frac{1}{2} + 2\frac{2}{3}$
5.) A quiche recipe calls for $2\frac{3}{4}$ cups of grated cheese. A recipe for quesadillas requires $1\frac{1}{3}$ cups of grated cheese. What is the total amount of grated cheese needed for both recipes?	6.) You want to make a scarf and matching hat. The pattern calls for $1\frac{7}{8}$ yards of fabric for the scarf and $2\frac{1}{2}$ yards of fabric for the hat. How much fabric do you need in all?

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Unit: Knowledge of Number Relationships & Computation

Objective: Add, **subtract**, and multiply positive fractions and mixed numbers. - B

Examples:

- To subtract unlike fractions (fractions with different denominators), rename the fractions so there is a common denominator.

Subtract: $\dfrac{7}{8} - \dfrac{1}{2} =$ $\qquad$ $\dfrac{7}{8} = \dfrac{7x1}{8x1} = \dfrac{7}{8}$ $\qquad$ $\dfrac{1}{2} = \dfrac{1x4}{2x4} = \dfrac{4}{8}$ $\qquad$ $\dfrac{7}{8} - \dfrac{4}{8} = \dfrac{3}{8}$

Subtract: $5\dfrac{3}{4} - 2\dfrac{1}{3} =$ $\qquad$ $5\dfrac{3}{4} = 5\dfrac{3x3}{4x3} = 5\dfrac{9}{12}$ $\qquad$ $2\dfrac{1}{3} = 2\dfrac{1x4}{3x4} = 2\dfrac{4}{12}$

$5\dfrac{9}{12} - 2\dfrac{4}{12} = 3\dfrac{5}{12}$

**Note: If you have to borrow from the whole number change to improper fractions, find a common denominator, subtract, and then change back to proper fractions.

1.) Subtract: $\dfrac{9}{10} - \dfrac{1}{10}$

2.) Subtract: $\dfrac{2}{3} - \dfrac{1}{6}$

3.) Subtract: $9\dfrac{7}{10} - 4\dfrac{3}{5}$

4.) Subtract: $5\dfrac{3}{8} - 4\dfrac{11}{12}$

*Hint: Change to improper fractions first!

5.) Melanie had $4\dfrac{2}{3}$ pounds of chopped walnuts. She used $1\dfrac{1}{4}$ pounds in a recipe. How many pounds of chopped walnuts did she have left?

6.) Lois has $3\dfrac{1}{3}$ pounds of butter. She uses $\dfrac{3}{4}$ pound in a recipe. How much does she have left? *Hint: Change to improper fractions first.

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Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, and multiply positive fractions and mixed numbers. - C
Examples:

- To multiply fractions – Multiply the numerators & denominators.
- Be sure to change mixed numbers to improper fractions before multiplying.

$$\frac{1}{3} x \frac{5}{8} = \frac{5}{24}$$

$$1\frac{1}{3} x 3\frac{2}{5} = \frac{4}{3} x \frac{17}{5} = \frac{68}{15} = 4\frac{8}{15}$$

**Remember: Changing mixed numbers to improper fractions. $2\frac{3}{4} = 4x2+3 = \frac{11}{4}$

$$1\frac{1}{3} x 21 \quad = \quad \frac{4}{3} x \frac{21}{1} \quad = \quad \frac{4x21}{3x1} = \frac{84}{3} = 28$$

1.) $\frac{2}{3} x \frac{4}{5} =$	2.) $\frac{7}{3} \times 4\frac{1}{2} =$
3.) $2\frac{1}{2} \times 2\frac{1}{3} =$	4.) $3 \times 5\frac{2}{9} =$
5.) Anna wants to make 4 sets of curtains. Each set requires $5\frac{1}{8}$ yards of fabric. How much fabric does she need?	6.) One sixth of the students at a local college are seniors. The number of freshmen students is $2\frac{1}{2}$ times that amount. What fraction of the students are freshmen?

Unit: Knowledge of Number Relationships & Computation

Objective: Identify and use the properties of addition and multiplication to simplify expressions using the commutative property.

Examples:

PROPERTY	ARITHMETIC	ALGEBRA
Distributive Property	$5(3+4) = 5(3) + 5(4)$	$a(b + c) = a(b) + a(c)$
Commutative Property of Addition	$5 + 3 = 3 + 5$	$a + b = b + a$
Commutative Property of Multiplication	$5 \times 3 = 3 \times 5$	$a \times b = b \times a$
Associative Property of Addition	$(2 + 3) + 4 = 2 + (3 + 4)$	$(a + b) + c = a + (b + c)$
Associative Property of Multiplication	$(4 \times 5) \times 6 = 4 \times (5 \times 6)$	$(a \times b) \times c = a \times (b \times c)$
Identity Property of Addition	$5 + 0 = 5$	$a + 0 = a$
Identity Property of Multiplication	$5 \times 1 = 5$	$a \times 1 = a$

1.) Use the distributive property to write the expression s an equivalent expression. Then evaluate the expression.

$$3(5 + 1) =$$

2.) Name the property shown:

$$6 + (1 + 4) = (6 + 1) + 4$$

3.) Name the property shown:

$$y \times 3 = 3 \times y$$

$22 - 11 = ?$

4.) Name the property shown:

$$b + 0 = b$$

5.) Mr. Brooks was working on addition using dominoes with a group of 1st graders. When picking the domino with 3 dots on one end and 5 dots on the other, some students read. "3 plus 5 equals 8" while other read it as "5 plus 3 equals 8." What property were these students using? Explain.

6.) Students in Mr. River's class were practicing their multiplication skills by rolling three 6-sided number cubes. Bailey rolled a 2, a 3, and a 5 on her roll. He multiplied the three numbers as follows using the order of operations: $(2 \times 3) \times 5 = 30$. Write another way Bailey could have performed the multiplication without changing the order of the numbers. State the property you used.

Unit: Knowledge of Number Relationships & Computation
Objective: Determine rate of increase and decrease, discounts, simple interest, commission, sales tax. - B
Examples:

■ SALES TAX is a percent of the purchase price and is an amount paid in addition to the purchase price.

Determine the total price of a $17.55 soccer ball if the sales tax is 6%.
   Determine the sales tax by changing % to a decimal and multiply.   17.55 x 0.06 = 1.07 (TAX)
   Add price and tax to determine the total price.   17.55 + 1.07 = 18.82

■ COMMISSION is the amount a salesman/woman makes for selling items. To determine the amount of commission, change the % to a decimal and multiply by the total amount sold.

Determine the commission for a RV salesman, whose sales for the month of March totaled $149,000. The salesman earns a 4% commission.
   Change 4% to a decimal.   4% = 0.04   Multiply decimal and total sold.   0.04 x 149,000 = 5960
   The RV salesman/woman will make a total commission of $5,960 for the month of March.

■ SIMPLE INTEREST the amount of money paid or earned for the use of money. To determine simple interest I, use the formula I = prt. Principal p is the amount of money deposited or invested. Rate r is the annual interest rate written as a decimal. Time t is the amount of time the money is invested in years.

Determine the simple interest earned in a savings account where $136 is deposited for 2 years if the interest rate is 7.5% per year.
   I = prt   I = 136 · 0.075 · 2   I = 20.40   The simple interest earned is $20.40

1.) Jeremy wants to buy a skateboard but does not know if he has enough money. The price of the skateboard is $85 and the sales tax is 6%. What will be the total cost of the skateboard?	2.) Blake bought two magazines for $4.95 each. If the sales tax was 6.75%, what was the total amount that he paid for the magazines?
3.) How much interest will Hannah earn in 4 years if she deposits $630 in a savings account at 6.5% simple interest?	4.) You are a real estate agent. For every house you sell you earn 3.8% commission. This month you sold 2 houses that had a combined total of $560,950. How much commission will you earn?
5.) When Melissa was born, her parents put $8,000 into a college fund account that earned 9% simple interest. Determine the total amount in the account after 18 years.	6.) A car salesman earns 7% commission on his total sales this month. If he sells 2 cars at $15,670 each, and a truck at $25,995, how much commission will he earn? (hint: You need to find the total amount of sales first)