

7th 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:

$$\begin{array}{r} b + 3 = 6 \quad \text{original equation} \\ -3 \quad -3 \quad \text{subtract 3 from each side} \\ \hline b + 0 = 3 \quad \text{solution} \\ b = 3 \quad \text{simplify} \end{array}$$

$$\begin{array}{r} b - 8 = 4 \quad \text{original equation} \\ +8 \quad +8 \quad \text{add 4 to each side} \\ \hline b + 0 = 12 \quad \text{solution} \\ b = 12 \quad \text{simplify} \end{array}$$

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:

$$4b = 16 \quad \text{original equation}$$

$$\begin{array}{r} \underline{\quad} \quad \underline{\quad} \\ 4 \quad 4 \end{array} \quad \text{divide both sides by 4}$$

$$1b = 4 \quad \text{solution}$$

$$b = 4 \quad \text{simplify}$$

$$\frac{m}{6} = 11 \quad \text{original equation}$$

$$6 \times \frac{m}{6} = 11 \times 6 \quad \text{multiply each side by 6}$$

$$1m = 66 \quad \text{solution}$$

$$m = 66 \quad \text{simplify}$$

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: Compare or classify triangles as scalene, equilateral, or isosceles.

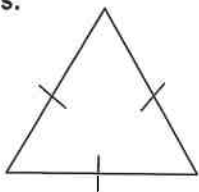


Triangles are polygons that have **three sides**, three vertices, and three angles.

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**.

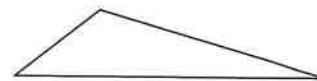
Examples:



Equilateral triangle
Three congruent sides



Isosceles triangle
Two congruent



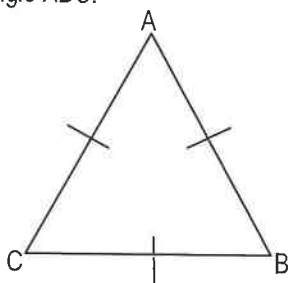
Scalene triangle
No congruent sides

1.) Shown is Equilateral triangle ABC .

$$\overline{AB} = 6 \text{ cm.}$$

$$\overline{BC} = \underline{\hspace{2cm}}$$

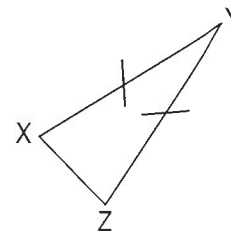
$$\overline{CA} = \underline{\hspace{2cm}}$$



2.) Shown is Isosceles triangle XYZ .

$$\overline{XY} = 5 \text{ in.}$$

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



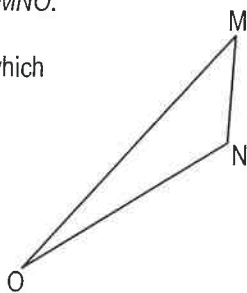
3.) Shown is Scalene triangle MNO .

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

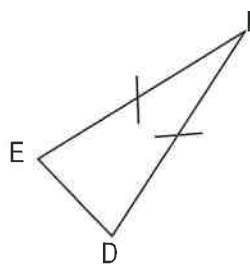
3 cm, 5 cm, 6 cm

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.



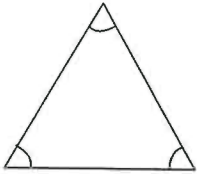
Triangles are polygons that have three sides, three vertices, and **three angles**.

Triangles can be **classified according to their angles**.

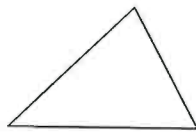
All triangles have at least 2 acute angles. **Acute, Right, and Obtuse triangles** are **classified according to their third angle**.

The same markings on the angles of a triangle show that the angles are **congruent**.

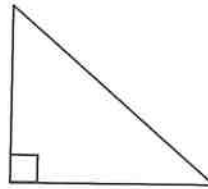
Examples:



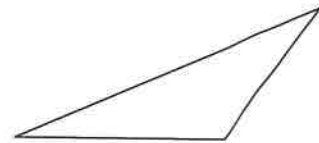
Equiangular triangle
Three congruent angles



Acute triangle
Three acute angles

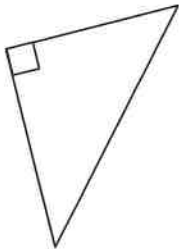


Right triangle
One right angle



Obtuse triangle
One obtuse angle

1.)

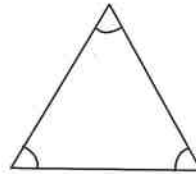


What type of triangle is this?

Circle the correct answer:

- Equiangular
- Acute
- Right
- Obtuse

2.)



What type of triangle is this?

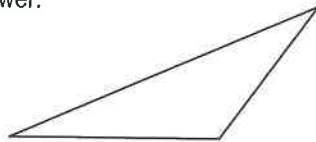
Circle the correct answer:

- Equiangular
- Acute
- Right
- Obtuse

3.) What type of triangle is this?

Circle the correct answer:

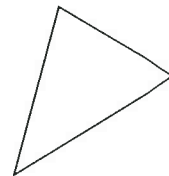
- Equiangular
- Acute
- Right
- Obtuse



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°? 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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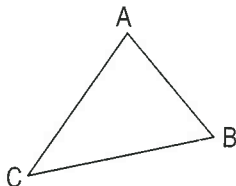
Unit: KNOWLEDGE of GEOMETRY

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°

<p>1.) Given triangle XYZ:</p> <p>Angle X = 90°</p> <p>Angle Y = 45°</p> <p>Angle Z = _____$^\circ$</p>	<p>2.) Given triangle MNO:</p> <p>Angle M = 15°</p> <p>Angle N = _____$^\circ$</p> <p>Angle O = 135°</p>
<p>3.) Given right triangle ABC:</p> <p>Angle A is the right angle</p> <p>Angle B = 55°</p> <p>Angle C = _____$^\circ$</p>	<p>4.) Given equiangular triangle FGH:</p> <p>What is the measure of ...</p> <p>Angle F? _____$^\circ$</p> <p>Angle G? _____$^\circ$</p> <p>Angle H? _____$^\circ$</p>
<p>5.) Given triangle JKL:</p> <p>Angle J = 120°</p> <p>Angle K = 50°</p> <p>Angle L = 20°</p> <p>Is this possible? Explain why or why not using math.</p>	<p>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°.</p> <p>What is the angle measure of the third angle? _____$^\circ$</p> <p>Please show your work:</p>

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Unit: KNOWLEDGE of GEOMETRY

Objective: Identify, or describe angle relationships using perpendicular bisectors or angle bisectors.



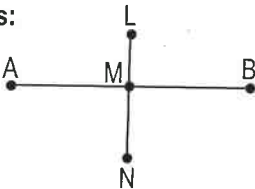
To **bisect** something means to separate it into **two equal parts**.

When a **line segment** is **bisected with a perpendicular line segment**, you have **two line segments that are congruent** (or equal in length.)

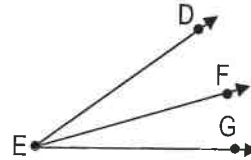
The original line segment and the perpendicular line segment **meet at right (90°) angles**.

When an **angle** is **bisected**, the **resulting two angles are congruent**.

Examples:



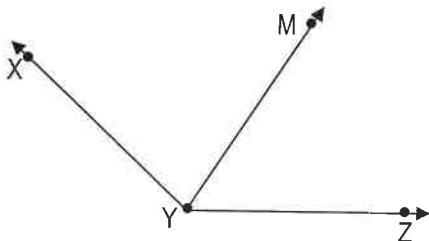
Line segment \overline{LN} is the **perpendicular bisector** of line segment \overline{AB} , so line segment \overline{AM} is congruent to line segment \overline{MB} . Angle LMB is 90° .



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

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

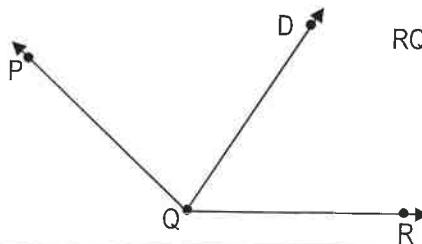
Angle _____ and angle _____ are congruent.



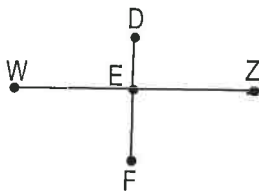
2.) Angle PQR measures 124° . Ray \overline{QD} bisects angle PQR. What is the measure of angle DQR and angle RQD?

DQR = _____ $^\circ$

RQD = _____ $^\circ$



3.)



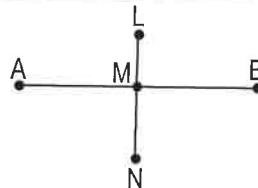
Line segment \overline{WZ} is the original line segment.

Line segment \overline{DF} is the _____.

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

The measure of angle WEF is _____ $^\circ$.

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

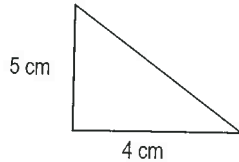
Objective: Estimate and determine the area of a triangle with whole number dimensions.



The area (**A**) of a triangle is one half the product of the base (**b**) and the height (**h**).

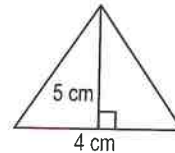
The formula for finding the area of a triangle is: $A = \frac{1}{2}bh$ and is measured in square units.

Examples:



$$A = \frac{1}{2}bh \quad A = \frac{1}{2} \times 4 \times 5 \quad A = \frac{1}{2} \times 20$$

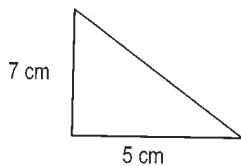
$$A = 10 \text{ cm}^2$$



$$A = \frac{1}{2}bh \quad A = \frac{1}{2} \times 4 \times 5 \quad A = \frac{1}{2} \times 20$$

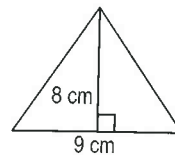
$$A = 10 \text{ cm}^2$$

1.) Determine the area of the triangle.



$$A = \underline{\hspace{2cm}} \text{ cm}^2$$

2.) Determine the area of the triangle.



$$A = \underline{\hspace{2cm}}$$

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

$$A = \underline{\hspace{2cm}}$$

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

$$A = \underline{\hspace{2cm}}$$

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.

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Unit: KNOWLEDGE of MEASUREMENT

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

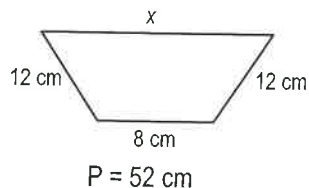


A **quadrilateral** is any four-sided, closed, 2-dimensional figure.

The **perimeter (P)** of any quadrilateral is the sum of the lengths of its four sides.

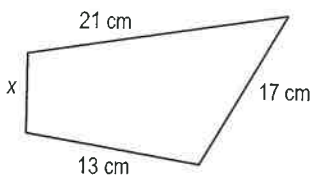
The **missing side** of a quadrilateral can be found using addition and subtraction.

Examples:



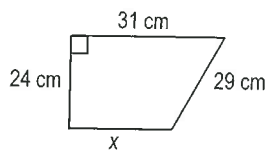
$$\begin{aligned}
 P &= s + s + s + s \\
 52 &= 12 + 8 + 12 + x \\
 52 &= 32 + x \\
 \underline{- 32} \quad \underline{- 32} \\
 20 &= x \quad \text{The length of the missing side is 20 cm.}
 \end{aligned}$$

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



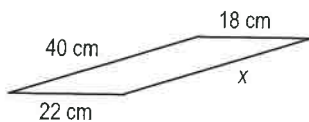
$$\begin{aligned}
 P &= 60 \text{ cm} \\
 x &= \underline{\hspace{2cm}}
 \end{aligned}$$

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



$$\begin{aligned}
 P &= 99 \text{ cm} \\
 x &= \underline{\hspace{2cm}}
 \end{aligned}$$

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



$$\begin{aligned}
 P &= 124 \text{ cm} \\
 x &= \underline{\hspace{2cm}}
 \end{aligned}$$

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.

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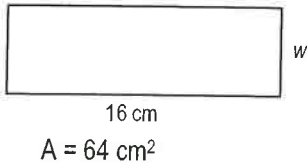
Unit: KNOWLEDGE of MEASUREMENT

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)**. $A = l \times w$
 The **missing measure** of a square or rectangle can be determined by using **division**.

Examples:

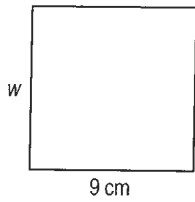


$$A = l \times w$$

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

4 = w The width of the rectangle is 4 cm.

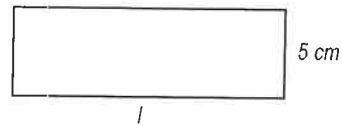
1.) Determine the missing side of the square. Please show your work.



$$A = 81 \text{ cm}^2$$

$$w =$$

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



$$A = 65 \text{ cm}^2$$

$$l =$$

3.) Determine the missing side of a rectangle with an area of 144 cm² and a width of 8 cm. Please show your work.

4.) Determine the missing side of a rectangle with an area of 480 cm² 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 mm². What must be the length of the sticker to cover the top of the bar?

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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.

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

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

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

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

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

$$\text{Range} = 61 - 15 = \$46$$

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

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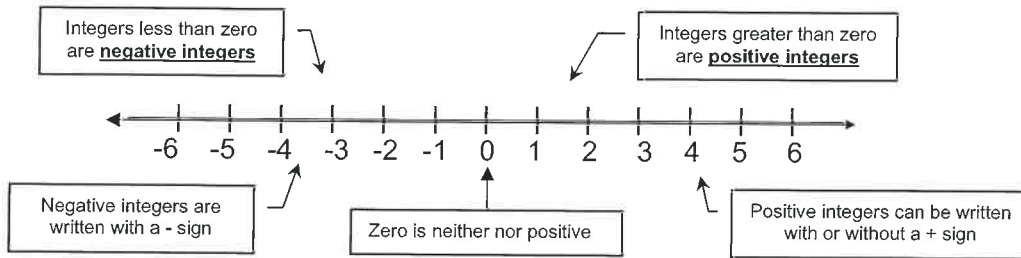
Unit: NUMBER RELATIONSHIPS and COMPUTATION

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.

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

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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)

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

Method 2: Divide 21 by 25

$$\begin{array}{r} \frac{21}{25} \rightarrow 25 \overline{)21.00} \\ \underline{-200} \\ 100 \\ \underline{-100} \\ 0 \end{array}$$

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

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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

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

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

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?

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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

$\frac{a}{b}$

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 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

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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:

$\frac{3}{8} < \frac{12}{24} < \frac{14}{24}$

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) $\frac{3}{8} = 0.375$

$\frac{3}{8} = \frac{9}{24}$

$\frac{7}{12} = \frac{14}{24}$

2) Compare the decimals:

$0.3 < 0.375 < 0.38$

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

$$\begin{array}{r} 0.375 \\ 8 \overline{)3.000} \\ \underline{-24} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

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 $\frac{24}{25}$

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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

$$\begin{array}{r} 2) \quad \frac{1}{2} = \frac{4}{8} \\ \quad \frac{3}{8} = \frac{3}{8} \\ \hline \quad \frac{7}{8} \end{array}$$

- 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

$$\begin{array}{r} 2) \quad 3\frac{3}{5} = 3\frac{18}{30} \\ \quad -1\frac{1}{6} = -1\frac{5}{30} \\ \hline \quad 2\frac{13}{30} \end{array}$$

- 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 $64\frac{1}{4}$ pounds and Nathan weighs $76\frac{1}{2}$ pounds. How much more does Nathan weigh than Marty?

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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) $\frac{1}{2} \times \frac{3}{8} = \frac{3}{16}$
- 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) $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 3) $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 4) Simplified: $\frac{45}{21} = 2\frac{1}{7}$

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 $1\frac{1}{2}$ times further from school than Jamie does. If Jamie lives $4\frac{1}{5}$ miles from school, how far does Belinda live?

6.) Mario practices his guitar every day for $\frac{3}{4}$ of an hour. How long does he practice for week?

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Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Multiply decimals.

Examples: Multiply 3.4 X 1.2

3.4
X 1.2
 68 ← multiply 34 by 2 (ignore the decimal point)
+ 340 ← multiply 34 by 10 (the 1 is in the tens place)
 408 ← 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.) 1.2×0.5

2.) 3.3×4.6

3.) 0.4×0.6

4.) 7.89×5

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?

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Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Divide decimals.

Example: Divide $45.9 \div 3$

$$\begin{array}{r} 15.3 \\ 3 \overline{) 45.9} \\ \underline{-3} \\ 15 \\ \underline{-15} \\ 9 \\ \underline{-9} \\ 0 \end{array}$$

Place decimal directly above the decimal point in the dividend

Divide as with whole numbers

1.)

$$4 \overline{) 12.5}$$

2.)

$$5 \overline{) 32.12}$$

3.) $215 \div 10$

4.) $3 \div 8$

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?

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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

$$25\% = \frac{1}{4}$$

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

Therefore 25% of 40 is 10.

Method 2:

Change the percent to a decimal and multiply

$$25\% = 0.25$$

$$0.25 \times 40 = 10.00$$

Therefore 25% of 40 is 10.

$$\begin{array}{r} 40 \\ \times 0.25 \\ \hline 200 \\ +800 \\ \hline 10.00 \end{array}$$

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?

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Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Estimate to determine the product of a decimal and a whole number

Example: Multiply 6.45×7

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 6×7
3. Answer 42

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

1.) 6×1.65

2.) 0.82×4

3.) 3×9.95

4.) 12.9×7

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?

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Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Estimate to determine the quotient of a decimal.

Example: Divide $45.9 \div 10$

1. Estimate to the nearest tens.
45.9 rounds to 50
10 stays the same

$$10 \overline{)50}$$

2. Divide with estimated numbers.
3. Answer.

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.) $7.49 \div 14$

4.) $89.904 \div 34$

5.) Maria and twelve of her friends shared the cost of their lunch. If the lunch cost \$75.90, estimate how much 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?