

**Due date: 8/29/22**

**DIRECTIONS/INFORMATION:**

- The Summer Enrichment must be completed in its entirety over the summer and turned in on the **FIRST DAY OF SCHOOL**.
- This assignment will count as a test grade for the first marking period. Late submissions will reduce the grade earned.
- This packet contains math skills required for Pre-Algebra.
- The packet is divided into eight, one-week sections that will allow you to develop a schedule for completing the packet. Follow the directions given in each section of the packet carefully.

## Carver Engineering and Science

Mr. Lick - Pre-Algebra

2022-2023 School Year

Parents/Guardians:

It has been a wonderful year and I am already really excited about starting up again in the fall. In September, each 7th grader will be enrolled in a Pre-Algebra math class. The supply list for my class is below, please consider providing these for the start of school this fall. Thanks so much for your support, have a great summer!

### Supply List:

-Three ring binder with lined paper

-Pencils

-TI 84 Plus Graphing Calculator\*

\*The graphing calculator is required for all **high school** students. Although it isn't required for 7th grade, we will use them frequently in class and on homework in preparation for the PSSA Exams in June and the Keystone Exam in 8th grade. **Please be sure to write the student's name on both the case and the calculator body in Sharpie so it can be returned if left behind.** If you do not purchase one, I will have some calculators available to borrow in the fall.



## WEEK 1: Algebraic Expressions

### **Web Resources:**

#### Exponents:

- <https://www.youtube.com/watch?v=ZJDb7E6aCrA>
- <https://www.khanacademy.org/math/in-seventh-grade-math/exponents-powers/in-exponents/v/introduction-to-exponents>

#### Parts of Algebraic Expressions:

- <https://www.khanacademy.org/math/in-seventh-grade-math/algebraic-expressions/terms-expression/v/expression-terms-factors-and-coefficients>
- <https://www.youtube.com/watch?v=ffLLmV4mZwU>

#### Evaluating Algebraic Expressions:

- <https://www.youtube.com/watch?v=kS4H-DOlhAE>
- <https://www.youtube.com/watch?v=NybHckSEQBI>

#### Simplifying Algebraic Expressions:

- <https://www.youtube.com/watch?v=DKC74YKJpNY>
- [https://www.youtube.com/watch?v=3NHSwiv\\_pSE](https://www.youtube.com/watch?v=3NHSwiv_pSE)

#### Equivalent Expressions:

- <https://www.youtube.com/watch?v=rHNY01R2VSQ>
- <https://www.youtube.com/watch?v=UqY0DDjxLGY>

Complete the following problems showing all steps (when necessary) in an organized way.

Simplify:

1.  $3^4$

2.  $4^3$

Name the underlined part of the expression.

3.  $3\underline{x} + 7$  \_\_\_\_\_

4.  $\underline{9} + 2y$  \_\_\_\_\_

5.  $\underline{5}h + 2y + 8$  \_\_\_\_\_

6.  $7p + \underline{3b} + 10$  \_\_\_\_\_

Evaluate each expression given the variable.

7.  $3x + 7$ , when  $x = 2$

8.  $9 - 2y$ , when  $y = 4$

Simplify the following expressions.

9.  $6h + 7 - 2h$

10.  $2(4x + 9) - 10$

11. Which of the following expressions are equivalent to  $10x + 8$  ? Circle all that apply.

a.  $5(2x + 8)$

b.  $2(5x + 4)$

c.  $2x + 7 + 8x + 1$

d.  $12x - 2 - 2x + 10$

e.  $10(x + 8)$

WEEK 2: Order of Operations, One Step Equations & Inequalities:

**Web Resources:**

Order of Operations:

- <https://www.khanacademy.org/math/pre-algebra/order-of-operations#order-of-operations-ddp>

Solving 1 Step Equations:

- <https://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-solving-basic-equations/v/one-step-equations>

Solving & Graphing 1 Step Inequalities:

- <https://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-linear-inequalities/v/one-step-inequalities>

Remember to complete the following problems **without** a calculator. Please show all work.

ORDER OF OPERATIONS:

1.  $12 \div 2 \cdot 2 + 15$

2.  $(10 + 5) + 24 \div 6$

3.  $(54 - 4) \div 5 - 3^2$

4.  $(8 - 3)^2 + 20 \div 5$

ONE STEP EQUATIONS: Solve each equation. Show all work.

1.  $m - 4 = 12$

2.  $26 = 8 + v$

3.  $\frac{b}{3} = 9$

4.  $7x = 49$

ONE STEP INEQUALITIES: Show all work.

Solve the following inequalities and then graph the solution on the number line provided.

1.  $n - 6 < 3$

2.  $3 + x \geq 15$



3.  $\frac{x}{2} > 4$

4.  $4x \leq 20$



## WEEK 3: Fraction, Mixed Number, & Decimal Operations

### **Web Resources:**

Adding Fractions:

- <https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/fractions-unlike-denom-pre-alg/v/adding-fractions-with-unlike-denominators>

Subtracting Fractions & Mixed Numbers:

- <https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/mixed-number-add-sub-pre-alg/v/subtracting-mixed-numbers>

Multiplying Mixed Numbers:

- <https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/mixed-number-mult-div-pre-alg/v/multiplying-mixed-numbers>

Dividing Mixed Numbers:

- <https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/mixed-number-mult-div-pre-alg/v/dividing-mixed-numbers>

Adding Decimals:

- <https://www.khanacademy.org/math/arithmetic/decimals/adding-decimals/v/adding-decimals-example-1>

Subtracting Decimals:

- <https://www.khanacademy.org/math/pre-algebra/decimals-pre-alg/adding-decimals-pre-alg/v/subtracting-decimals>

Multiplying Decimals:

- <https://www.khanacademy.org/math/pre-algebra/decimals-pre-alg/multiplying-decimals-pre-alg/v/multiplying-decimals>

Dividing Decimals:

- <https://www.khanacademy.org/math/pre-algebra/decimals-pre-alg/dividing-decimals-pre-alg/v/dividing-decimals>

FRACTION OPERATIONS:

Remember, **do not use a calculator** to complete these problems. Show all work. Final answers should be reduced and in mixed number form, if necessary.

1.  $\frac{7}{12} + \frac{3}{4} =$

2.  $1\frac{5}{6} - \frac{3}{8} =$

3.  $2\frac{3}{7} \cdot \frac{1}{3} =$

4.  $\frac{7}{10} \div \frac{4}{5} =$

DECIMAL OPERATIONS: Remember, **do not use a calculator** to complete these problems. Show all work

1.  $3.625 + 9.4 =$

2.  $15.68 - 7.34 =$

3.  $0.78 \cdot 1.5 =$

4.  $6.42 \div 0.03 =$



## WEEK 4: Ratios & Unit Rates

### Web Resources:

Ratios:

- <https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-ratios-prop-topic/cc-6th-ratios-intro/v/ratios-intro>

Unit Rate/Price:

- <https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-ratios-prop-topic/cc-6th-rates/v/finding-unit-rates>
- <https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-ratios-prop-topic/cc-6th-rates/v/finding-unit-prices>

1. Write the ratio of 6 girls to 8 boys in three different ways. Answers should be in reduced form.

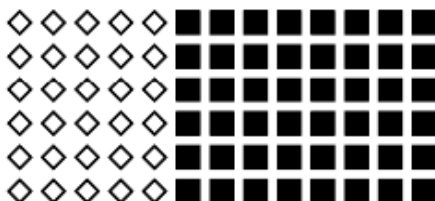
Words	Ratio	Fraction

2.



What is the ratio of  
♥ to ★ ? = \_\_\_\_ : \_\_\_\_ = \_\_\_\_ : \_\_\_\_ Simplified

What is the ratio of  
★ to ( ♥ + ★ ) ? = \_\_\_\_ : \_\_\_\_ = \_\_\_\_ : \_\_\_\_



What is the ratio of  
◇ to ■ ? = \_\_\_\_ : \_\_\_\_ = \_\_\_\_ : \_\_\_\_ Simplified

What is the ratio of  
■ to ( ◇ + ■ ) ? = \_\_\_\_ : \_\_\_\_ = \_\_\_\_ : \_\_\_\_

3.

Which two types of cars have equivalent ratios of miles traveled to hours of time during the trip? \_\_\_\_\_

Cars	Miles Traveled	Hours of Time
Toyota	28	2
Lexus	48	4
Chevrolet	42	3
Honda	46	3

Which two baseball games have equivalent ratios of walks to the number of runs scored? \_\_\_\_\_

Games	Walks	Number of Runs Scored
Cubs	3	32
Yankees	4	40
Marlins	3	33
Red Sox	2	22

4. Tom and Paul are building a brick wall. Tom lays 420 bricks in 6 hours. Paul lays 240 bricks in 3 hours. Whose rate is faster? Show all work.

5. A 12 oz. box of Thanksgiving stuffing is \$1.92, while a 16 oz. box costs \$2.88. Which is the better buy? Show all work.

WEEK 5: Fraction, Decimal, & Percent

**Web Resources:**

**Intro to percent:**

- <https://www.youtube.com/watch?v=JeVSmq1Nrpw>
- <http://mathwords.com>
- <https://www.khanacademy.org/math/arithmetic/decimals/percent-tutorial/v/percent-word-problems>

**Converting between fraction, decimal, percent:**

- <https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/decimals-fractions-pre-alg/v/representing-a-number-as-a-decimal-percent-and-fraction>
- <https://www.khanacademy.org/math/arithmetic/decimals/percent-tutorial/v/representing-a-number-as-a-decimal-percent-and-fraction-2>

**Find percent of a number:**

- <https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-decimal-operations/v/taking-a-percentage-example>

**Find the whole, given a part & percent:**

- [https://www.youtube.com/watch?v=Kyk2j\\_Ecufc](https://www.youtube.com/watch?v=Kyk2j_Ecufc)

1) Complete the chart below by converting between fractions, decimals, and percents.

FRACTION	DECIMAL	PERCENT
$\frac{3}{4}$		
	.23	
		18%
		5%
	0.3	
$\frac{73}{100}$		

2. Find the values of the following and show all work.

a. 25% of 24 \_\_\_\_\_

b. 62% of 200 \_\_\_\_\_

c. 18 out of 97 is what %? \_\_\_\_\_

d. What percent is 15 out of 60? \_\_\_\_\_

e. 30% of what number is 6? \_\_\_\_\_

f. 8% of what number is 24? \_\_\_\_\_

3. A student answered 22 out of 25 questions correctly on the test. What percent did the student answer correctly?

WEEK SIX: Area, Perimeter, Surface Area & Volume

**Web Resources:**

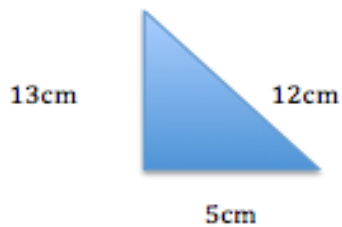
Area & Perimeter

- <https://www.khanacademy.org/math/basic-geo/basic-geo-area-perimeter/basic-geo-area-perimeter-polygon/v/perimeter-and-area-basics>

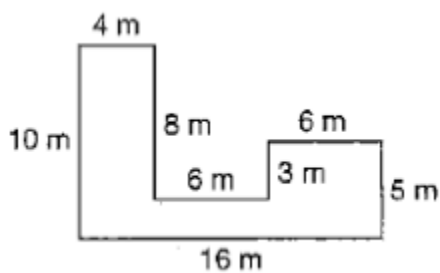
Surface Area

- <https://www.khanacademy.org/math/basic-geo/basic-geo-volume-surface-area>

1. Find the area of the triangle shown below. Show all work.



2. Find the perimeter AND area of the figure shown below. Show all work.



Perimeter: \_\_\_\_\_

Area: \_\_\_\_\_

3. You are doing a mathematics experiment that involves comparing the surface area of rectangular prisms to their volume. Use the following figures to complete the chart. Show all work.

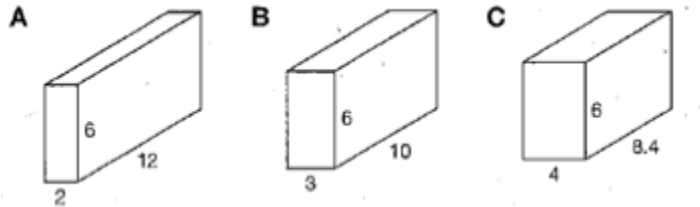


Figure	Surface Area	Volume
A	_____	_____
B	_____	_____
C	_____	_____

Do you see a pattern for the surface area of the rectangular prisms? For their volume?

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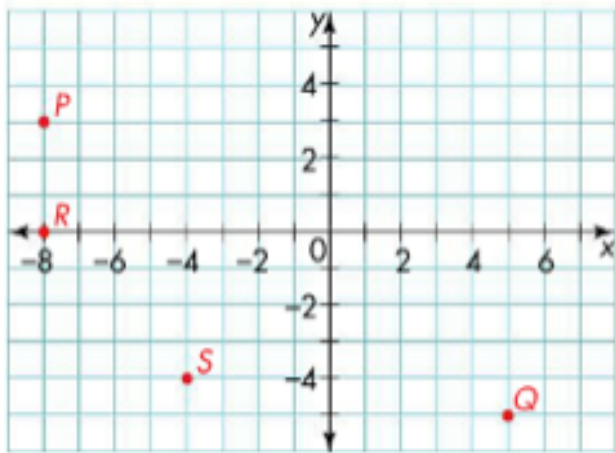
WEEK 7: Coordinate Plane

**Web Resources:**

Coordinate Plane:

- <https://www.khanacademy.org/math/basic-geo/basic-geo-coordinate-plane/copy-of-cc-6th-coordinate-plane/v/the-coordinate-plane>

1. Label each point on the coordinate plane and provide its quadrant or axis.



- P. (     ,     ) Quadrant: \_\_\_\_\_  
Q. (     ,     ) Quadrant: \_\_\_\_\_  
S. (     ,     ) Quadrant: \_\_\_\_\_

2. What is the distance between point S and a point with the coordinates (4, - 4)?
3. Find the area of a shape with coordinates A (2, 6), B (2, 0), C (8,0) and D (8, 6).

## WEEK 8: Data

### **Web Resources:**

Line Plots:

- [http://www.phschool.com/atschool/academy123/english/academy123\\_content/wl-book-demo/ph-116s.html](http://www.phschool.com/atschool/academy123/english/academy123_content/wl-book-demo/ph-116s.html)

Box-and-Whisker Plot (Box Plot):

- <http://www.virtualnerd.com/algebra-2/probability-statistics/central-tendency-dispersion/dispersion/practice-box-whisker>
- <https://www.youtube.com/watch?v=CoVf1jLxgj4>

Mean:

- <http://www.virtualnerd.com/middle-math/probability-statistics/mean-data-set.php>

Median:

- <http://www.virtualnerd.com/middle-math/probability-statistics/median-data-set.php>

Mode:

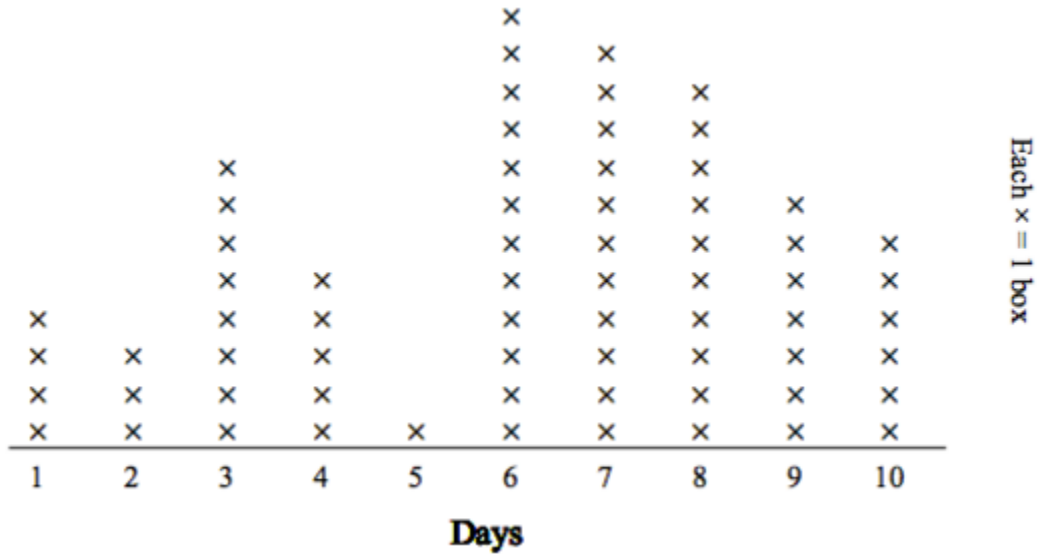
- <http://www.virtualnerd.com/middle-math/probability-statistics/mode-data-set.php>

Range:

- <http://www.virtualnerd.com/middle-math/probability-statistics/range-data-set.php>



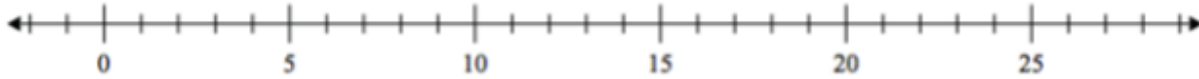
Tom was selling boxes of chocolate candy for his school's fundraiser. He plotted the number of boxes he sold on the line plot below. Use his line plot to answer the questions.



1. On which day did he sell the most boxes? \_\_\_\_\_
2. On which day did he sell the least number of boxes? \_\_\_\_\_
3. Did he sell fewer boxes on day 3 or day 9? \_\_\_\_\_
4. How many days did he sell more than 3 boxes? \_\_\_\_\_
5. How many boxes did he sell on days 4 and 6 together? \_\_\_\_\_

6. Make a box-and-whisker plot below with the given set of data, then answer the questions.

9, 13, 18, 16, 14, 19



- a.) What is the range of the data? \_\_\_\_\_
- b.) What is the IQR (interquartile range) of the data? \_\_\_\_\_
- c.) What is the median? \_\_\_\_\_
- d.) What is the mean? \_\_\_\_\_
- e.) What is the mode? \_\_\_\_\_

Find the indicated information about the data set below and show all work.

7. 29, 22, 22, 17, 33, 32, 27

Mean: \_\_\_\_\_

Median: \_\_\_\_\_

Mode: \_\_\_\_\_

Range: \_\_\_\_\_

8. Jerry was counting the money he received for his birthday. From his aunt he received \$9. From his uncle he received \$9. His best friends gave him \$22, \$23, \$22, and \$22. And his sister gave him \$7. Show all work.

Mean: \_\_\_\_\_

Mode: \_\_\_\_\_

Median: \_\_\_\_\_

Range: \_\_\_\_\_