

Dear Algebra Student,

Summer 2020

After this very unusual school year, I hope you have a wonderful summer. Enjoy yourself, relax and have fun. It hopefully goes without saying; you should need **NO INSTRUCTION** and **NOT NEED A CALCULATOR** to do:

Add, subtract, multiply and divide **whole numbers, decimals & fractions** ; Know the fraction, decimal and percent equivalents; Set up and solve a proportion; Solve one and two operation equations

For you to be a highly successful Algebra student, you need to have the following skills in this packet **MASTERED** before you walk into the classroom. Show me that you know this information by completing this packet and **SHOWING ALL WORK.** Bring this packet with you ready to grade on **Thursday August 20th.**

You will be taking a **Basic Skills Test** when we start the school year to make sure you are proficient in these topics. When completing the packet, you may use any resources available to help you with your work such as your math notebook from 7th grade and websites like Khan Academy. This summer work will be taken as your first grade for Algebra.

We will be using the graphing calculator throughout the year starting in November. It is recommended to get the **TI 83 or 84 plus.** You will be using this calculator through high school. We will also be using the on-line graphing calculator Desmos.com during the year.

Sincerely,

Gail Brenner - Algebra Teacher

Order of Operations – without a calculator

1. $\frac{2}{3} [8 (5 - 2)^2 + 3 * 2]$

2. $\frac{5 * 3 + 3}{4 * 2 + 2}$

Evaluate Expressions – without a calculator

3. If $a = 6$ $b = 4$ $d = \frac{1}{2}$ $\frac{a^2 - b^2}{2 + d^3}$

Simplify Expressions using the distributive property

4. $4(3X + 2) - 2(X + 3)$

Add, subtract, multiply and divide rational numbers - You should do these without a calculator!

5. $\frac{3}{4} + -\frac{5}{8} + \frac{3}{32} =$

6. $6.7 - 8.1 + 7.3 =$

7. $(-6.8)(5.4)(3) =$

8. $(\frac{3}{5})(-\frac{2}{3})(-3)(\frac{2}{9}) =$

Solving equations– use PROPER ALGEBRA FORMAT and CHECK STEPS

9. $\frac{-13}{5}y = -22$

10. $0.4X = 6.25$

11. $34 = 8 - 2X$

12. $-3(X + 2) = -18$

13. $2(X + 5) = 4(X - 8)$

Translating expressions – Define your variable and translate (ex, Let $y =$ an number)

14. Fourteen less than three times a number Y

15. The sum of a number X and the square of Y

Translating word problems (define a variable, set up equation and solve)

16. Sandy buys and prints t-shirts for \$4 each. There is a one-time silk-screening fee of \$20. How many t-shirts can she buy and print for \$80?

17. Jane has 2 more coins than Fred. Jane and Fred have a total of 12 coins. How many coins does each person have?

Using formulas

18. $D = R * T$ if $D = 120$ miles $T = 4.5$ hours $R = ?$

Percent Problems – set up a proportion or equation to solve.

19. 26 is what percent of 65?

20. What is the total cost of a suit that costs \$275 with a $6\frac{1}{2}\%$ sales tax?

21. What will the sale price of a bike that is \$120 and has a 15% discount?

Linear Equations

Write linear equations in the form of $y = mx + b$ for:

22. The total cost of renting a boat for \$7 per hour and a \$3 charge for life preservers.

Writing Equations from Tables – Moving Straight Ahead Inv. 1

$y = mx + b$ m = constant rate of change (slope) b = y-intercept (start-up value)

Write a linear equation for the following tables:

1. $y =$ _____

X	Y
0	0
1	3
2	6
3	9
4	12

2. $Y =$ _____

X	Y
0	8
1	5
2	2
3	-1
4	-4

3. $y =$ _____

X	Y
0	5
1	7
2	9
3	11
4	13

4. $Y =$ _____

X	Y
1	6
2	10
3	14
4	18
5	22

5. $y =$ _____

X	Y
0	-2
1	1
2	4
3	7
4	10

6. Which ordered pairs are solutions to the equation? (plug in the values x and y into the equation and solve, does it make a true statement?) **SHOW YOUR WORK!**

a. $y = 16 + 4x$ (2, 40) (2, 24) (5, 36)

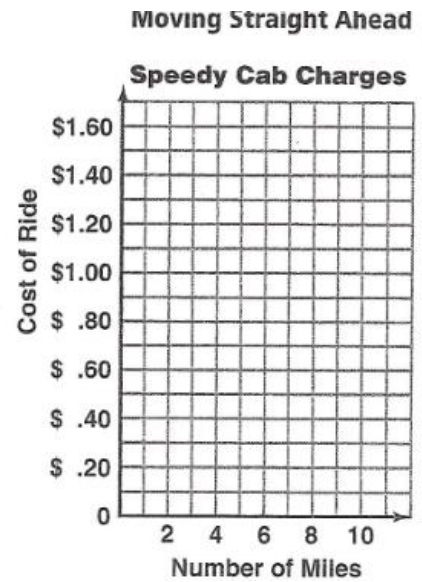
c. $y = 2x - 5$ (5, 5) (7, 9) (0, -5)

7. A ride in a cab costs \$0.40 plus \$0.15 per mile.

a. Write and graph an equation for traveling x miles in the cab.

b. The cab charges \$0.70 for a ride of how many miles?

c. How much does the cab charge for a trip of 8 miles?



More Moving Straight Ahead Inv. 1 & 2

1. a. Which of the following tables represent linear relationships?
Circle your choice(s).

Time (s)	Distance (m)
0	5
1	10
2	12
3	16
4	20

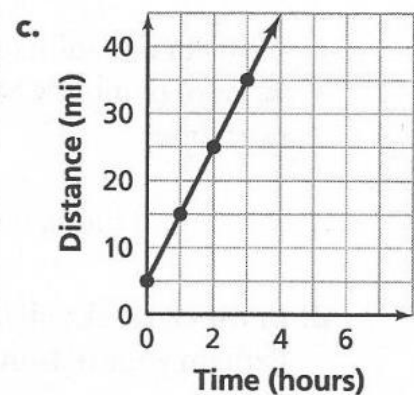
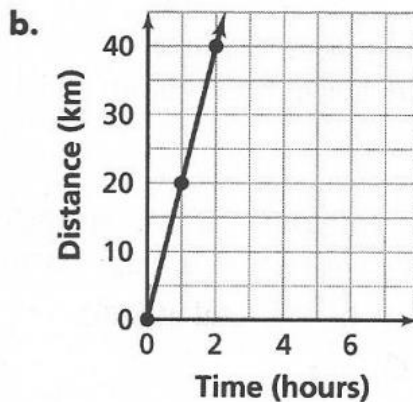
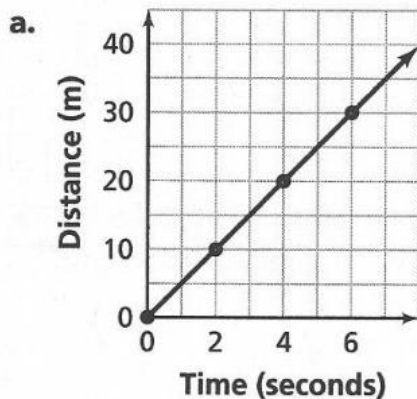
Distance (km)	Money (\$)
0	0
1	10
2	20
3	30
4	40

Days	Money (\$)
0	10
1	8
2	6
3	4
4	2

- b. Write an equation for one of the tables that represents a linear relationship.

- c. Which table(s), if any, represents a proportional relationship? Explain.

2. Each graph below represents a linear relationship between time and distance.
For each graph, what is the rate of change?



Rate: _____

Rate: _____

Rate: _____

3. a. Jason is participating in a walkathon. He writes the equation $m = 2d + 50$ to represent the amount of money he collects from each sponsor for walking d kilometers. What number represents the rate of change?

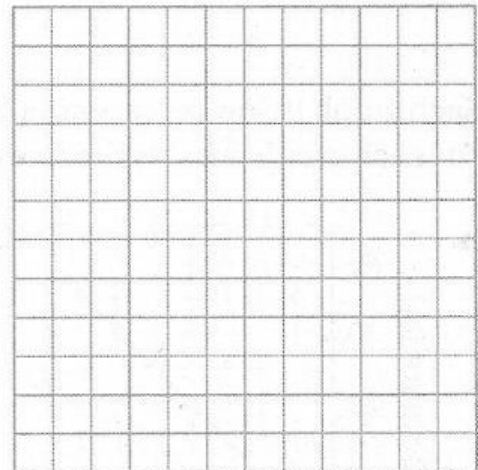
b. Cierra is keeping track of the amount of money in her lunch account each week. She writes the equation $A = -6w + 40$. What number represents the rate of change?

4. Mark opens a bank account with \$20. He plans to put in \$5 each week.

a. Complete the table below to show the **total** amount of money Mark has in his bank account from 0 to 10 weeks.

Time (weeks)											
Money (\$)											

b. Use the grid to make a graph that matches the table.



c. Write an equation to represent the **total** amount of money Mark has in his account over time.

d. In which week will Mark have a total of \$60?
Explain your reasoning.

Moving Straight Ahead Inv. 2

Decide if each table represents a linear relationship. For those that do, write an equation that represents the relationship.

1.

X	Y
0	18
1	6
2	-6
3	-18

2.

X	Y
-3	-17
-1	-11
1	-5
3	1

3.

X	Y
5	-2
7	0
9	2
11	4

4.

X	Y
-4	4
0	6
2	7
3	8

Moving Straight Ahead Inv. 3

1. Find the value of the indicated variable.

a. Suppose $y = 2x + 10$. Find y if $x = -2$.

b. Suppose $y = 2x - 2.5$. Find x if $y = 10$.

2. Solve each equation to find the value of x . Use **Algebraic format** and **check** your equations.

ALGEBRA

CHECK

a. $4x + 10 = 22$

b. $3x + 9 = 6x$

c. $2(x + 3) = 18$

d. $2x + 15 = 27 - 4x$

More Equation Solving: Use **Proper Algebra Format** and **check steps.**

ALGEBRA

CHECK

1. $15 = -15 - 8x$

2. $\frac{2}{3}x + 9 = -11$

3. $\frac{x}{4} + 7 = -2$

4. $1 - \frac{x}{5} = 12$

5. $-3x + 7 = 2x - 13$

6. $12 - 5x = 8 + 3x$

ALGEBRA**CHECK**

7. $9(x + 3) = 4x - 3$

8. $3x + 8(2x - 6) = 2 + 14x$

9. $4x - (9 - 3x) = 8x - 1$

10. $2(6x + 3) = 18 - 3(16 - 3x)$

Dividing with Long Division – You are NOT allowed to use a calculator to solve these. Show ALL work!

Use “traditional” long division to divide these whole numbers and decimals. You may need to ask your parents for help or go to:

https://www.khanacademy.org/math/arithmetic/multiplication-division/long_division/v/division-2

$$1) \quad 42 \overline{)13,188}$$

$$2) \quad 75 \overline{)405,450}$$

$$3) \quad 84 \overline{)367,920}$$

$$4) \quad 38 \overline{)76,817}$$

$$5) \quad 9.72 \overline{)9.234}$$

$$6) \quad 7.8 \overline{)7.41}$$

$$7) \quad 6.36 \overline{)14.31}$$

$$8) \quad 0.005 \overline{)0.41}$$

$$9) \quad 4.04 \overline{)0.606}$$

Notes for Adding and Subtracting Fractions

*** You **MUST** have **common denominators**

*** **LEAVE mixed numbers** as mixed numbers to add and subtract

ex. $\frac{2}{9} + \frac{1}{6}$

$$\begin{array}{r} \frac{2 \times 2}{9 \times 2} = \frac{4}{18} \\ + \frac{1 \times 3}{6 \times 3} = \frac{3}{18} \\ \hline \frac{7}{18} \end{array}$$

1) Make common denominator and scale up numerator by the same value.
 2) Add/subtract numerator. Leave over common denominator.
 3) Simplify if possible.

ex. $2\frac{4}{9} + 3\frac{5}{12}$

$$\begin{array}{r} 2\frac{4 \times 4}{9 \times 4} = 2\frac{16}{36} \\ + 3\frac{5 \times 3}{12 \times 3} = 3\frac{15}{36} \\ \hline 5\frac{31}{36} \end{array}$$

ex. $\frac{8}{14} - \frac{3}{7}$

$$\begin{array}{r} \frac{8}{14} - \frac{3}{7} \rightarrow \frac{8}{14} - \frac{6}{14} \\ \hline \frac{2}{14} = \frac{1}{7} \end{array}$$

ex. $8\frac{1}{2} - 2\frac{2}{3}$

Borrow 1 ($1 = \frac{6}{6}$ and $\frac{6}{6} + \frac{3}{6} = \frac{9}{6}$)

$$\begin{array}{r} 8\frac{1 \times 3}{2 \times 3} = 8\frac{3}{6} \rightarrow 7\frac{9}{6} \\ - 2\frac{2 \times 2}{3 \times 2} = 2\frac{4}{6} \\ \hline 5\frac{5}{6} \end{array}$$

To multiply fractions

**** Do NOT make common denominators

**** Change mixed numbers into improper fractions

**** Simplify within the problem to make it easier, by dividing out common factors.

ex. $\frac{3}{7} \times \frac{5}{9} = \frac{5}{21}$

1) Cross simplify
 2) multiply across

ex. $\frac{8}{21} \times \frac{14}{20} = \frac{4}{15}$

(8:20 divide by 4; 14:21 divide by 7)

ex. $2\frac{1}{2} \times 3\frac{2}{5} = \frac{5}{2} \times \frac{17}{5} = \frac{17}{2}$ or $8\frac{1}{2}$

To divide fractions

**** Do NOT make common denominators

**** Change mixed numbers into improper fractions

**** Multiply by the reciprocal

$$\begin{array}{l} \text{ex. } \frac{3}{8} \div \frac{5}{7} \rightarrow \frac{3}{8} * \frac{7}{5} = \frac{21}{40} \\ \text{ex. } 4\frac{2}{3} \div 2\frac{1}{3} \rightarrow \frac{14}{3} \div \frac{7}{3} \rightarrow \frac{14}{\cancel{3}^2} * \frac{\cancel{3}^1}{7} = 2 \\ \text{ex. } 8\frac{1}{3} \div 2\frac{1}{2} \rightarrow \frac{25}{3} \div \frac{5}{2} \rightarrow \frac{25}{\cancel{3}^5} * \frac{2}{\cancel{5}^1} = \frac{10}{3} \end{array}$$

Rational Number work – Use previous pages for fraction instructions. You are **NOT allowed** to use a calculator to solve these, **SHOW ALL WORK!** Make sure all answers are simplified to lowest terms.

1. $-21.5 + 34.27$

6. $-2.45 * -3.61$

2. $-78.6 - 8.348$

7. $\frac{3}{5} + \frac{7}{8}$

3. $12.57 - -5.163$

8. $-\frac{2}{9} + -\frac{5}{6}$

4. $-18.7 * 2.95$

9. $18\frac{4}{5} + 25\frac{1}{3}$

5. $0.625 * -3.54$

10. $-125\frac{2}{7} + 38\frac{3}{14}$

11. $-22\frac{4}{9} - 3\frac{2}{3}$

$$12. \frac{18}{35} - \frac{2}{7}$$

$$13. 11\frac{1}{8} - 4\frac{3}{4}$$

$$14. -\frac{24}{35} * \frac{14}{16}$$

$$15. -\frac{28}{40} * \frac{20}{49}$$

$$16. 5\frac{1}{3} * 3\frac{1}{4}$$

$$17. -12 \div -\frac{2}{3}$$

$$18. -\frac{5}{12} \div \frac{15}{21}$$

$$19. 8\frac{1}{4} \div -2\frac{3}{5}$$

$$20. -6\frac{2}{5} \div -8$$

Find the missing side lengths of these similar figures. Make sure you find the missing side “x” and “y” for each. **Show your work by:**

- Creating a proportion
- Find the Scale Factor
- Solve with label

