

# Algebra 1 Week 2

Dear Parent/Guardian,

During Week 2, we will review and support mastery of the Algebra 1 standards: Reasoning with equations and Inequalities. Your child will work towards building on justifications for solving equations. Additionally, students will create and solve equations that represent real-world situations. There are nine topics in this section. It is suggested you complete two topics per day; on day five only one topic is listed. A proposed schedule is included.

Additionally, students can access both Math Nation and the Pearson textbook through ClassLink. Both sites offer instructional support including video lessons, practice quizzes and more.

We also suggest that students have an experience with math each day. Practicing at home will make a HUGE difference in your child's school success! Make math part of your everyday routine. Choose online sites that match your child's interests. Online math games, when played repeatedly, can encourage strategic mathematical thinking, help develop computational fluency, and deepen their understanding of numbers.

Links for additional resources to support students at home are listed below:

<https://www.brainpop.com/games/sortifyangles/>

<https://www.hoodamath.com/games/highschool.html>

<https://www.khanacademy.org/resources/teacher-essentials>

<https://www.mangahigh.com/en-us/games/wrecksfactor>

<http://www.xpmath.com/forums/arcade.php?do=play&gameid=115>

<https://www.purplemath.com/modules/>

<b>Week 2 At A Glance</b>	
Day 1	<b>Section 2 - Equations and Inequalities</b> Topic 1: Equations: True or False? Topic 2: Identifying Properties When Solving Equations
Day 2	<b>Section 2 - Equations and Inequalities</b> Topic 3: Solving Equations Topic 4: Solving Equations Using the Zero Product Property
Day 3	<b>Section 2 - Equations and Inequalities</b> Topic 5: Solving Inequalities - Part 1 Topic 6: Solving Inequalities - Part 2
Day 4	<b>Section 2 - Equations and Inequalities</b> Topic 7: Solving Compound Inequalities Topic 8: Rearranging Formulas
Day 5	<b>Section 2 - Equations and Inequalities</b> Topic 9: Solution Sets to Equations with Two Variables

## Section 2: Equations and Inequalities

### Student Learning Plan

Topic Number	Topic Name	Date Completed	Study Expert(s)	Check Your Understanding Score
1	Equations: True or False?			
2	Identifying Properties When Solving Equations			
3	Solving Equations			
4	Solving Equations Using the Zero Product Property			
5	Solving Inequalities – Part 1			
6	Solving Inequalities – Part 2			
7	Solving Compound Inequalities			
8	Rearranging Formulas			
9	Solution Sets to Equations with Two Variables			
Honors 1	Solving Power Equations			

*\*Honors resources are available online.*

<b>What did you learn in this section? What questions do you still have?</b>
<b>Who was your favorite Study Expert for this section? Why?</b>



## Section 2 – Topic 1 Equations: True or False?

1. Consider the statement:  $4 - 3 + 5 = -6 + 8 + 4$ . This is a mathematically correct sentence.

Is the sentence true or false? Explain how you know.

2. Determine if the sentence is true. Select all that apply.

- $2 + 5 = 19 - 12$   
  $\frac{4}{5} + \frac{1}{5} = 2 - 1 - 1$   
  $5 - 4 - 3 - 2 - 1 = 30 - 34 - 1$   
  $2(x + 8) = 2x - 8$   
  $2(x + 5) - 4x = 3(x - 2) - 5x + 16$

3. Determine whether the following number sentences are TRUE or FALSE. Justify your answer.

Part A:  $7 + 5 + 3 + x = x + 3 + 12$

Part B:  $\frac{1}{2} - \frac{5}{8} - \frac{7}{9} = \frac{7}{9} - \frac{5}{8} - \frac{1}{2}$

Part C:  $6^3 + 5^2 = 18 + 5^2$

Part D:  $(2 + 2)^2 = 2^2 \cdot 2^2$

4. For the equation,  $x - 7 = 24$ , can a value be substituted for  $x$  to make the equation a true number sentence? How many values could be substituted for  $x$  and have a true number sentence?

5. Consider  $x + 4 = x + 8$ . What values could be substituted for  $x$  to make this a true number sentence? Explain how you know.

6. Determine what value(s) for the variable would make each algebraic equation a true number sentence.

$m^2 = 81$  is true for \_\_\_\_\_.

$6p = 3p + 2p + p$  is true for \_\_\_\_\_.

$r + 74 = r - 74$  is true for \_\_\_\_\_.



7. Which of the following has the correct solution given for  $x$ ? Check all that apply.

- $3x - 3 = 24; x = 9$
- $4 + x + 5 - x = 20; x = 3$
- $\frac{x+5}{7} = 5; x = 30$
- $9 = 2x - 3; x = 6$
- $50 = \frac{1}{3}x + 5; x = 48$

## Section 2 – Topic 2

### Identifying Properties When Solving Equations

1. The following pairs of equations are equivalent. Describe the operation that occurred in the second equation.

*Part A:*  $3 + 9 = 12$  and  $3 + 9 - 5 = 12 - 5$

*Part B:*  $x - 4 = 7$  and  $x - 4 + 4 = 7 + 4$

*Part C:*  $2(6) = 12$  and  $\frac{2(6)}{2} = \frac{12}{2}$

*Part D:*  $\frac{x}{2} = 5$  and  $2 \cdot \frac{x}{2} = 2 \cdot 5$

2. Complete the following table with the properties used to solve  $4(x + 3) = 20$ .

Statements	Proof
$4(x + 3) = 20$	<i>Given</i>
$4x + 12 = 20$	
$4x = 8$	
$x = 2$	



3. Complete the following table with the mathematical statements that correspond to the proofs used to solve  $\frac{4(x-3)}{3} = 20$ .

Statements	Proof
$\frac{4(x-3)}{3} = 20$	Given
	Multiplication Property of Equality
	Distributive Property
	Addition Property of Equality
	Division Property of Equality

4. Consider the equations  $5x + 10 = 30$  and  $5(x + 10) = 30$ .

Do they have the same solution? Why or why not?

5. Consider the equations  $3x + 2 = 14$  and  $2 + 3x = 14$ .

Do they have the same solution? Why or why not?

6. Consider the equation  $3(x + 2) + 3x = 36$ .

Without solving, name all the properties that would be used to solve the equation.

7. Consider the equation  $\frac{x}{3} + 7 = 13$ .

*Part A:* Write an equivalent equation using the multiplication property of equality.

*Part B:* What properties will you use next to solve the equation?

8. Solve the following equation. Justify each step.

$$0.2x + 3.1 - 2.1x = 0.3(x - 5) + 0.2$$

9. Write an equation in which the distributive property, commutative property, associative property, addition or subtraction property of equality, and multiplication or division property of equality can be used to find the solution.

10. Solve the equation that you wrote in Question 9, justifying each step.



## Section 2 – Topic 3

### Solving Equations

1. Solve the equation for  $x$ . For each step, identify the property used to convert the equation.

Part A:  $18 = 6(2x - 8)$

Part B:  $8 + 3b = -13$

Part C:  $\frac{x-3}{4} = 12$

Part D:  $14 + 3n = 8n - 3(n - 4)$

Part E:  $22x + 11 = 4x - 7$

2. During summer vacation, you charge people \$8 per hour for swimming lessons and a \$20 registration fee. If you make \$52 one day, how many hours did you spend teaching lessons?
3. Lacoste Middle School surveyed its student population about their favorite mobile apps. The 786 students who listed Facebook as their favorite app represented 32 fewer students than two times the number of students who listed Instagram as their favorite app. How many students listed Instagram as their favorite app?
4. The 2015 senior class from Puma High School raised funds for an end of the year party at Club Sizzle. It costs \$4,000 to rent out Club Sizzle plus \$20 per student for food and drinks. If the senior class raised \$11,000, how many students can attend the end of year party?
5. Alex sells cars at Keith Palmer Ford. He earns \$400 a week plus \$150 per car he sells. If he earned \$1450 last week, how many cars did he sell?



## Section 2- Topic 4

### Solving Equations Using the Zero Product Property

1. Solve the following equation using the zero product property.

$$(x + 8)(x + 11) = 0$$

2. Solve the following equation using the zero product property.

$$(x + 9)(4x - 1) = 0$$

3. Solve the following equation using the zero product property.

$$5(-v - 5) \cdot 3(v - 8) = 0$$

4. Manny was given the equation  $(x + 2)(x - 17) = 0$  and asked to find the zeros. The solutions he came up with were  $x = 2$  and  $x = -17$ .

Are his solutions correct? Justify your answer.

5. Which equations have the same pair of solutions? Select all that apply.

- $(x + 6)(x - 6) = 0$   
  $(x + 6)(x + 6) = 0$   
  $(x - 6)(x - 6) = 0$   
  $(2x + 12)(2x - 12) = 0$   
  $(2x - 12)(x - 12) = 0$   
  $(x + 12)(x - 12) = 0$   
  $(x + 12)(x - 6) = 0$

6. Ted and Maggie solved the following equation,  $(3x - 2)(x + 5) = 0$ . Their work is shown below.

Ted	Maggie
$(3x - 2)(x + 5) = 0$	$(3x - 2)(x + 5) = 0$
$3x - 2 = 0$ or $x + 5 = 0$	$3x - 2 = 0$ or $x + 5 = 0$
$3x = 2$ or $x = -5$	$3x = -2$ or $x = 5$
$x = \frac{2}{3}$ or $x = -5$	$x = -\frac{2}{3}$ or $x = 5$

Who is correct? Correct the mistake in the incorrect work.



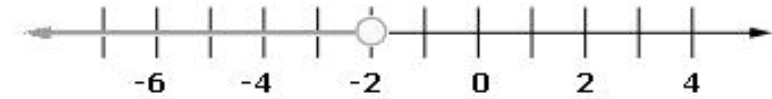
## Section 2 – Topic 5 Solving Inequalities – Part 1

1. Match the inequalities below with one of the statements in the table. Not all inequalities will be used.

$x \leq 35$	$x \leq 12$	$x > 3$
$x \leq 10$	$x > 32$	$x \geq 10$
$x \leq 5$	$x \geq 35$	$x \geq 3$
$x \geq 32$	$x \geq 12$	$x < 10$
$x < 40$	$x \leq 40$	$x \geq 5$

Statement	Inequality
A student will study German for at least 3 years.	
All employees work less than 40 hours.	
There are at least 35 people in the emergency room.	
The carton holds at most 12 eggs.	
There are no more than 10 gallons of gas in the tank.	
There are fewer than 10 yards of fabric left.	
The temperature is above 32°F.	
Years of experience cannot be less than 5 years.	

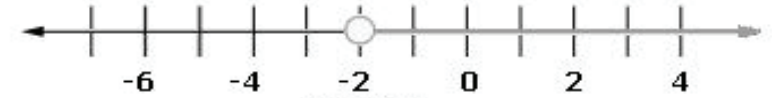
2. Consider the diagrams below.



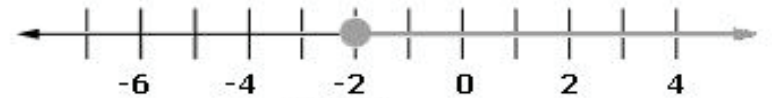
**Graph 1**



**Graph 2**



**Graph 3**



**Graph 4**

Write the inequality for each graph shown above:

Graph 1:

Graph 2:

Graph 3:

Graph 4:





3. The Latino Rams at Englewood High School are seeking to raise at least \$750 in a fundraiser to pay for their end-of-the year field trip to Islands of Adventures.

Part A: Write an inequality to represent this situation.

Part B: Graph the inequality on a number line.



4. Find the solution set to each inequality. Express the solution in set notation.

Part A:  $6m + 2 < 5m - 4$

Part B:  $\frac{a}{5} + 8 \leq 13$

Part C:  $-3(x - 7) > -27$

Part D:  $8(p - 6) > 4(p - 4)$

## Section 2 – Topic 6 Solving Inequalities – Part 2

1. In order for Brady to earn a B in his biology course, his test scores must average at least 80%. On the first 5 tests, he has an average of 77%. There is one test remaining in the course. What is the minimum score Brady needs to earn on the last test to receive a B in the class?
2. Shawn has been hired as a sales associate at the Horizon Mobile Phone Company. He has two salary options. He can either receive a fixed salary of \$750.00 per week or a salary of \$400.00 per week plus an 8% commission of his weekly sales. Which solution set among the options below represents the dollar amount of sales that he must generate each week in order for the option with commission to be the better choice?
  - A  $\{s | s > \$810.00\}$
  - B  $\{s | s > \$1150.00\}$
  - C  $\{s | s > \$4,375.00\}$
  - D  $\{s | s > \$9,375.00\}$
3. In GeoTown, there are 210 teenagers that own a tablet. This is at least  $\frac{4}{5}$  of all teenagers that live in GeoTown. What is the maximum number of teenagers who live in GeoTown?



4. Ms. Ache is paid \$1,250 per week but is fined \$100 each day she is late to work. Ms. Ache wants to make at least \$3,000 over the next three weeks so she can take a vacation.

Over the next three weeks, what is the maximum number of days she can be late to work and still reach her goal of making at least \$3,000?

5. The Hot Summer Fair is coming to town! Admission to the fair costs \$12.99 and each ride costs \$1.75. You have \$35 to spend at the fair including admission.

*Part A:* Write an inequality that represents this situation.

*Part B:* Solve the inequality to determine the maximum number of rides you can enjoy at the Hot Summer Fair.

## Section 2 – Topic 7 Solving Compound Inequalities

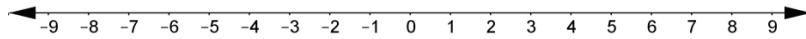
1. Match the compound inequalities below with one of the statements in the table. Not all inequalities will be used.

$-42 < x < 102$	$20 \leq x < 32$	$x > 0 \text{ and } x \leq 10$
$x < 25 \text{ or } x \geq 62$	$16 \leq x \leq 20$	$x < 54 \text{ and } x \geq 72$
$x < 54 \text{ or } x \geq 72$	$x > 0 \text{ and } x < 6$	$x > 85 \text{ or } x < 65$
$16 < x < 20$	$25 < x \leq 62$	$x > 85 \text{ and } x < 65$
$x \geq 20 \text{ or } x < 32$	$-42 \leq x \leq 102$	$x > 0 \text{ or } x < 6$

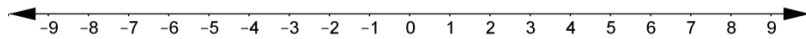
All real numbers that are less than six but more than 0.	
All real numbers between $-42$ and $102$ , inclusive.	
All positive real numbers less than or equal ten.	
All students earning above 85 or below a 65 were asked to report to the media center for further instructions.	
The expected weight must be greater or equal to 20 pounds but less than 32 pounds.	
Students under 25 or seniors at or above 62 get a discount.	
If temperature is at or above $72^\circ\text{F}$ or below $54^\circ\text{F}$ , the samples in the biology lab are no longer useful.	
Cookies must be baked between 16 and 20 minutes.	



2. Graph  $x \leq 8$  and  $x > -1$ .

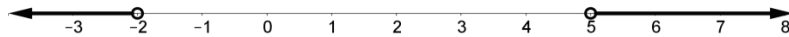


3. Graph  $x < -6$  or  $x \geq 4$ .

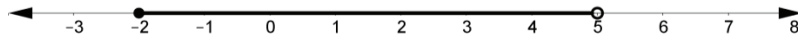


4. Write a compound inequality for the following graphs.

Part A:



Part B:



5. Amaya's test scores in Algebra 1 are 78 and 91. She has one more test left and wants to earn a B for the course, which is from 80-89 inclusive.

Part A: Write a compound inequality to represent the situation.

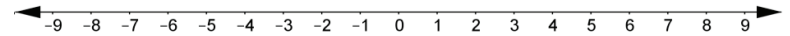
Part B: Solve the inequality to find the range of scores Amaya has to earn to get a B in Algebra 1.

6. Uncle Sammy invests money on stocks and makes 7 to 13 percent of the invested money.

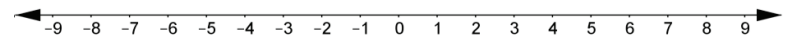
Calculate the range of money Sammy will make if he invests his next paycheck of \$2,300.

7. Solve and graph the following compound inequalities.

Part A:  $7 \leq 5x + 2 < 22$



Part B:  $-4p \geq 12$  or  $8 - 2p < 12$



8. An Indy car driver has to be a certain height to fit into the racecar. Consider the inequality  $175 \leq 3x - 17 \leq 187$ , where  $x$  represents the height of the driver in inches.

What is the range for the height of an Indy car driver?

9. Peyton is altering her new jacket to enter it into the Bodacious Bedazzling Contest. In order for a garment to be considered "bedazzled", it must contain a number of gems that fall within the range of the following inequality  $132 \leq \frac{1}{2}x + 7 \leq 193$ .

Find the range of gems Peyton must use to enter her jacket into the contest.

## Section 2 – Topic 8 Rearranging Formulas

1. Consider the following equation,  $bh + hr = 25$ .

*Part A:* Solve the equation for  $h$ .

*Part B:* Solve the equation for  $r$ .

2. Consider the following equation  $x = \frac{r-h}{y}$ .

*Part A:* Solve the equation for  $h$ .

*Part B:* Solve the equation for  $r$ .



3. Charlize and Camille solved the equation  $4x - 2y = 8$  for  $y$ . Their work is shown below.

Charlize  
 $4x - 2y = 8$

$$-2y = 8 + 4x$$

$$y = -4 - 2x$$

Camille  
 $4x - 2y = 8$

$$-2y = 8 - 4x$$

$$y = -4 + 2x$$

Which student solved the equation correctly? Justify your answer.

4. Solve the following equation for  $p$ .

$$2m = \frac{p-q}{r}$$

5. The formula to find the volume of a sphere is  $V = \frac{4}{3}\pi r^3$ , where  $r$  is the radius of the sphere. What is the formula in terms of  $r$ ?

## Section 2 – Topic 9

### Solution Sets to Equations with Two Variables

1. Martha can complete 15 activities a day at summer camp. She can choose between crafts or sports.

*Part A:* Define two variables and create an equation to represent the situation.

Variable 1:

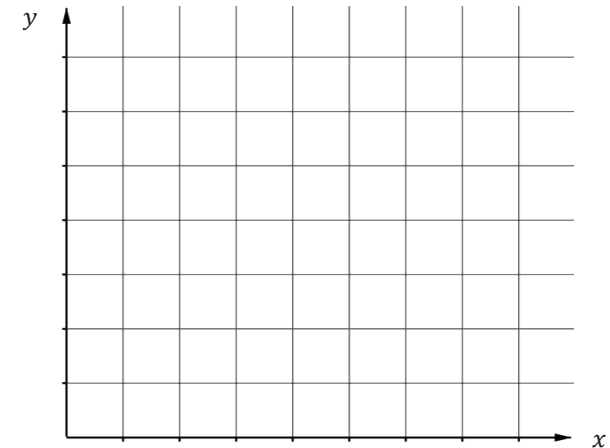
Variable 2:

Equation:

*Part B:* What are three possible combinations of crafts and sports that Martha can do?

*Part C:* Create a graph that represents the solutions to the equation from

*Part A.*



Part D: Are the solutions to the graph above discrete or continuous?  
Explain your answer.

2. Mahogany's favorite brand of ice cream is Ben & Jerry's. This weekend while she was doing her grocery shopping, she bought 9 single-serving containers, some "That's My Jam", and some "Cherry Garcia".

Part A: Define two variables and create an equation to represent the situation.

Variable 1:

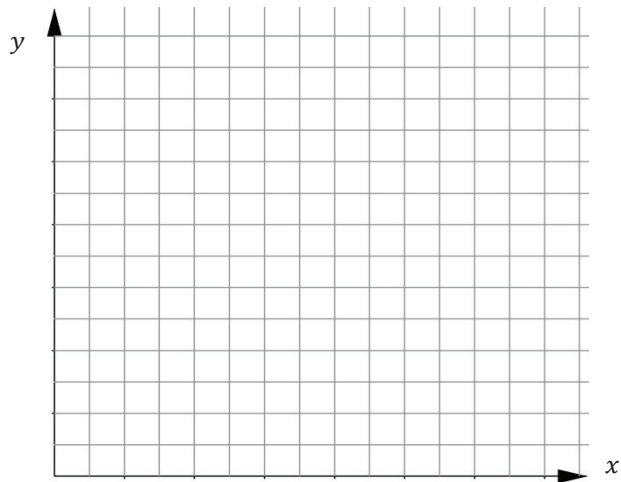
Variable 2:

Equation:

Part B: What are three possible combinations of "That's My Jam" and "Cherry Garcia" containers Mahogany might have purchased?

Part C: Create a graph that represents the solutions to the equation from

Part A.



Part D: Are the solutions to the graph above discrete or continuous?  
Explain your answer.

3. The sum of two numbers is 23.

Part A: Define two variables and create an equation to represent the situation.

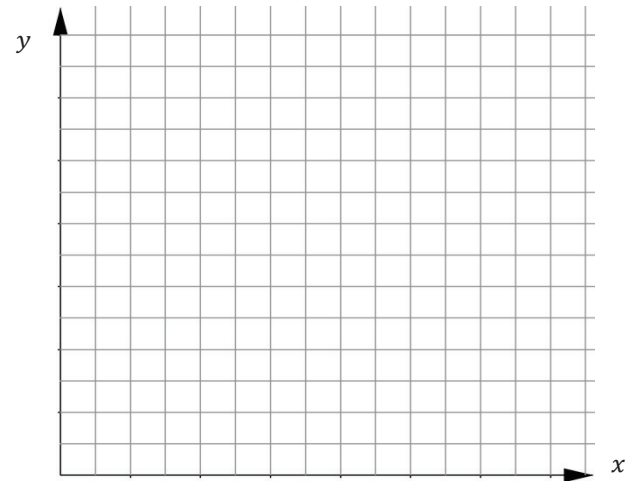
Variable 1:

Variable 2:

Equation:

Part B: What are three possible combinations of numbers that will satisfy the situation?

Part C: Create a graph that represents the solutions to the equation from Part A.



Part D: Are the solutions to the graph above discrete or continuous?  
Explain your answer.

4. Demarcus' workout playlist consists of classic rock songs and rap songs. His playlist contains a total of 47 songs.

Which of the following statements represent the number of classic rock and rap songs on Demarcus' playlist? Select all that apply.

- $x + y = 47$
- 24 and 24
- 43 and 4
- $x = y + 47$
- $y = -x + 47$
- 13 and 34

5. Debahni is moving boxes into her new house. She is able to move 17 boxes per hour. She is only able to move the small and medium size boxes.

Part A: Define two variables and create an equation to represent the situation.

Variable 1:

Variable 2:

Equation:

Part B: What are three possible combinations of numbers that will satisfy the situation?

Part C: Is this an example of a discrete or continuous function?

6. Mr. Mayntz's math class is made up of 29 students. Some of the students are male and some are female.

Which of the following statements represent the number of males and females in Mr. Mayntz's class? Select all that apply.

- 23.5 males and 5.5 females
- $x + y = 29$
- 12 males and 17 females
- $x = y - 29$
- $y = -x - 29$

