

Thoreau Middle School-Pre-Algebra 1  
Summer Enrichment Packet 2021

Welcome to Pre-Algebra!

This optional summer packet is for all students enrolled in Pre-Algebra at Thoreau Middle School for Fall 2021. This packet contains concepts that were taught in 7th Grade. It is important that you know and understand these concepts, as we will build on them in Pre-Algebra.

Please spend some time this summer keeping these skills and concepts fresh in your mind. The packet will not be turned in for a grade. Here are some helpful hints for success:

- ☺ Find a quiet work space where you can get organized and stay focused.
- ☺ Remember to do a little work each week. DO NOT wait until the week before school starts to complete your packet!
- ☺ Use all resources available to you to help complete the packet such as family members, friends, the internet, and of course . . . a calculator!

Have a great summer and see you in August!

From,  
The Pre-Algebra Teachers

In Pre-Algebra, we will use a hand-held scientific calculator as well as the on-line calculator DESMOS. You can access the DESMOS calculator at this link: <https://www.desmos.com/scientific>.

### Section 1– Integer Operations

**Directions:** In this section try to answer without using the calculator, then check your answers on the calculator.

- $8 - 19$
- $-7 - 12$
- $11 - (-2)$
- $-4 - (-1)$
- $|-5| + 8$
- $|-9| + (-5)$
- $4 \cdot (-7)$
- $-5 \cdot (-3)$
- $\frac{-8}{-4}$

### Section 2– Fraction Computation

**Directions:** Simplify each expression. Reduce all answers to their simplest form.

- $\frac{2}{5} + \frac{1}{8}$
- $\frac{9}{10} - \frac{3}{4}$
- $\frac{8}{9} \cdot \frac{3}{8}$
- $\frac{5}{7} \div \frac{3}{14}$
- $2\frac{1}{3} \cdot \frac{2}{7}$
- $\frac{3}{4} \div \frac{7}{6} \cdot \frac{4}{9}$

### Section 3– Compare and Order Rational Numbers

- Plot each of the following values on the number line provided.

$\sqrt{64}$

$3^2$

$-|-4|$

$600\%$

$5^0$



2. Order the rational numbers from least to greatest. (Convert to decimals first!)

<b>Numbers:</b>	$\sqrt{25}$	250%	$\frac{-15}{4}$	3
<b>Least to Greatest:</b>				

#### Section 4 – Order of Operations

Remember that the order of operations is

**Directions: Simplify each expression**

- ✓ Grouping
- ✓ Exponents
- ✓ Multiply or Divide (whichever comes first as you read left to right)
- ✓ Add or Subtract (whichever comes first as you read left to right)

In this section, try to answer without using a calculator, then check your answer on the calculator.

1.  $9 + 3^2 - 8 \cdot 2$

2.  $\frac{4+10 \cdot (-2)}{2^3}$

3. If  $a = 4$ ,  $b = -2$ ,  $c = 9$   
what is the value of  $bc + \sqrt{4a}$ ?

4. If  $x = -2$  and  $y = 3$ , what is the value  
of  $10y + 2|3x+2|$ ?

#### Section 5– Percent Computation

1. What is 5% of 90?

2. What is 20% of 800?

3. 6 is what percent of 60?

4. 20 is 15% of what number?

## Section 6– Equations

Directions: Solve each equation for the variable given. Check your answer through substitution.

1.  $-12 = x + 9$

2.  $7 - x = 18$

3.  $2x - 4 = -20$

4.  $\frac{1}{4}x = 9$

5.  $\frac{1}{3}x + 5 = 14$

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

Directions: Write the verbal sentence as an algebraic equation.

1. The product of a three and a number plus five is 20.

2. Nine less than a number is four.

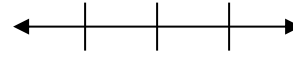
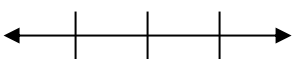
## Section 7– Inequalities

Directions: Solve each inequality for the variable given. Check your answer through substitution. Graph your answer on a number line.

1.  $2x - 11 < 13$

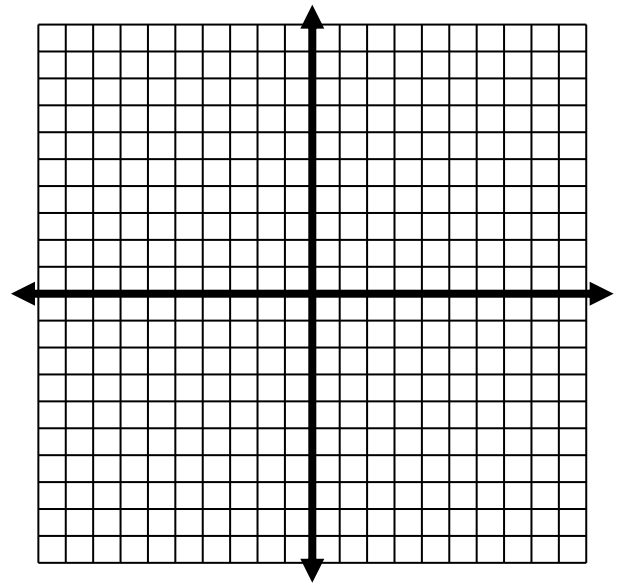
2.  $-5x \geq -15$

3.  $\frac{1}{6}x - 2 \geq -32$



**Section 8– Graphing on the coordinate plane**

- A. (4, 7)
- B. (-2, 6)
- C. (-5, -3)
- D. (1, -8)
- E. (0, 0)
- F. (0, 7)
- G. (-3, 0)

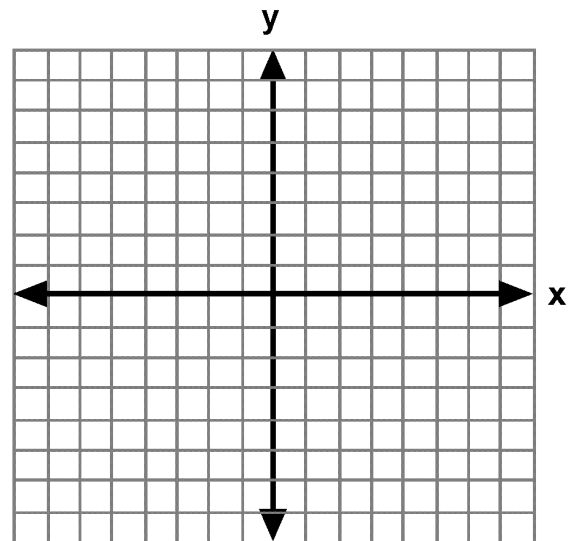


**Section 9– Functions**

1. Complete the function table based on the rule and then graph the resulting ordered pairs. Connect the ordered pairs to form a line.

Function Rule:  $y = 3x - 1$

x	y
-1	
0	
1	
2	



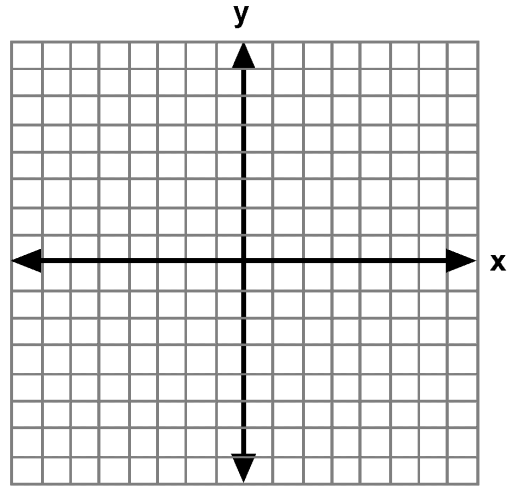
2. The table of values represents a relationship between  $x$  and  $y$ .

- a. Determine the  $y$ -intercept of the line that passes through the points represented by the values in this table.

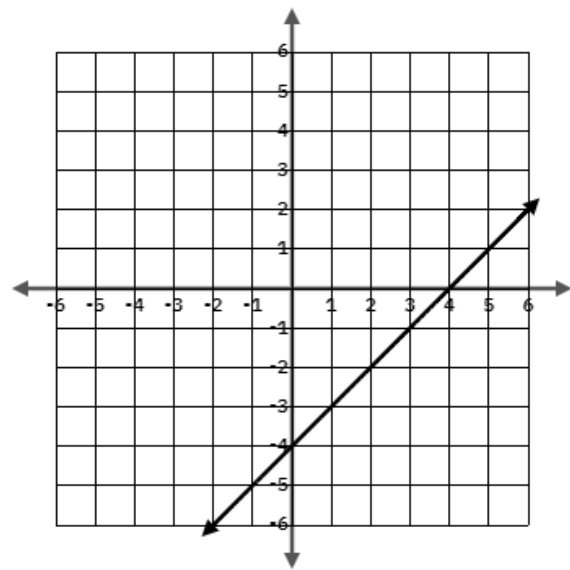
x	y
0	3
2	5
3	6

- b. Write an equation of the line that contains each point represented by this table of values.

3. Graph the line that passes through  $(-2, 3)$  and has a  $y$ -intercept of 5. Graph at least two additional points that lie on this line.



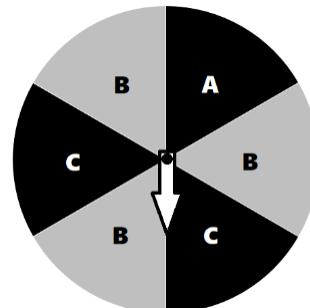
4. Write the equation of the line representing the relationship shown in the graph.



**Section 10– Probability**

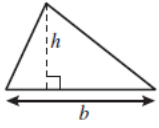
1. The sides of a fair number cube are labeled 1, 2, 3, 4, 5, and 6. What is the theoretical probability that the number cube will land with the number 5 facing up?

2. Find the theoretical probability that the spinner below lands on the letter B. Write your answer as a fraction in simplest form.

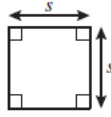


## Section 11– Geometry

Use the VDOE SOL formulas below to answer the following questions.

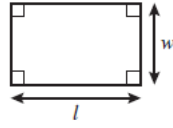


$$A = \frac{1}{2}bh$$



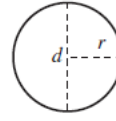
$$p = 4s$$

$$A = s^2$$



$$p = 2l + 2w$$

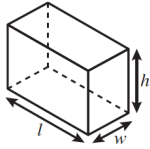
$$A = lw$$



$$C = 2\pi r$$

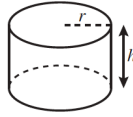
$$C = \pi d$$

$$A = \pi r^2$$



$$V = lwh$$

$$S.A. = 2lw + 2lh + 2wh$$



$$V = \pi r^2 h$$

$$S.A. = 2\pi r^2 + 2\pi r h$$

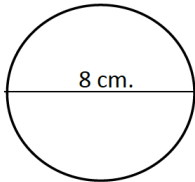
**Pi**

$$\pi \approx 3.14$$

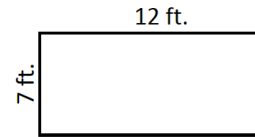
$$\pi \approx \frac{22}{7}$$

**Directions: For figures 1 – 3, calculate the area and the perimeter/circumference.**

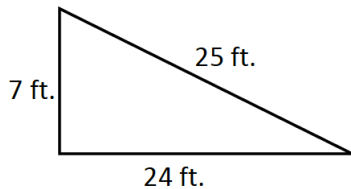
1.



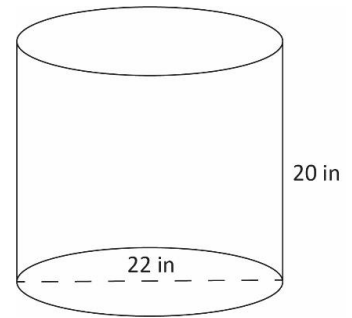
2.



3.



4. Find the surface area of the cylinder below. Round your answer to the nearest whole number.



5. Find the volume of the rectangular prism below. Round your answer to the nearest whole number.

