

Dear Parents of Rising Eighth Graders,

I am so excited to have the opportunity to teach your child again next year! I have thoroughly enjoyed getting to know each of them this school year.

I've attached a math packet the students will need to complete this summer. This packet includes important Pre-Algebra concepts they will need to review in order to better prepare them for Algebra I. Please have your child work on small portions of the packet throughout the summer. In order to receive full credit, they must SHOW ALL WORK on another sheet of paper! I have included sample problems for the concepts included in the packet. Please have your child look at these sample problems if they have any questions. This packet is due on the first day of school – August 6th, 2021.

Optional - If your child is struggling with operations with integers, I've decided to use the Delta Math program to reinforce integer rules. The Algebra I curriculum can be especially challenging if the students do not have a good understanding of integer rules. I can assure you they will feel more confident next school year if they know these integer rules. The students may work in Delta Math to practice operations with integers if they feel as though they need more practice. Please see Delta Math login instructions below.

If you or your child have additional questions, please don't hesitate to email me at sshuford@bullochacademy.com. I look forward to seeing everyone in August! Have a wonderful summer!

Sincerely,



Sommer Shuford

**** Instructions on how to create a Delta Math Account: (Please read carefully.)**

- 1) Go to deltamath.com
- 2) Click Create Account at the top right of the webpage
- 3) Click Student and then enter my teacher code: 487477
- 4) Click the drop down box that says "Period" and choose your class period. (Note: You will click Rising 8th Grade!)
- 5) Fill in your personal information and create a password – do not forget the password you created!:)

Sample Problems

Adding Integers -

- Same Signs → 1) Add the absolute values
Ex: $-2 + (-4) = \boxed{-6}$ 2) Keep the sign
- Different Signs → 1) Subtract
Ex: $-7 + 4 = \boxed{-3}$ 2) Take sign of # with larger absolute value.

Subtracting Integers -

- 1) Keep, change, change
 - 2) Follow addition rules
- Ex: $-4 - (-6) =$
 $-4 + 6 = \boxed{2}$

Multiply/Divide Integers -

- Same signs = positive #
- different signs = negative #

Ex: $-4(-8) = \boxed{32}$

Ex: $\frac{24}{-3} = \boxed{-8}$

Add/Subtract Fractions -

Get a common denominator + add/subtract the numerators.

$\frac{1}{4} + \frac{2}{3} =$ (make improper)

$$\begin{array}{r} \frac{7 \cdot 3}{4 \cdot 3} \frac{21}{12} \\ + \frac{2 \cdot 4}{3 \cdot 4} \frac{8}{12} \\ \hline \end{array} \rightarrow \boxed{\frac{29}{12}} \text{ OR } \boxed{2 \frac{5}{12}}$$

Multiply/Divide Fractions -

* Make mixed #'s improper fractions.

Ex: $\frac{2}{5} \cdot \frac{3}{4} = \frac{6}{20} \div 2 = \boxed{\frac{3}{10}}$

Ex: $2\frac{1}{5} \div 2\frac{1}{10} \rightarrow$ multiply by reciprocal

$$\frac{11}{5} \cdot \frac{10}{21} = \frac{110}{105} = \frac{22}{21} = \boxed{1\frac{1}{21}}$$

Order of Operations -

(PEMDAS)

$$4^2 - (3+1)^3 + 25 \div |-9| =$$

$$4^2 - (4)^3 + 25 \div 5 =$$

$$16 - 64 + 5 =$$

$$-48 + 5 = \boxed{-43}$$

Evaluate Expressions -

$$\sqrt{xy} - x^2 + 6 \quad \begin{array}{l} x = -2 \\ y = -8 \end{array}$$

$$\sqrt{(-2)(-8)} - (-2)^2 + 6$$

$$\sqrt{16} - 4 + 6$$

$$4 - 4 + 6$$

$$\boxed{6}$$

Distributive Prop./Combining Like Terms

$$-2(x-4) + 3x - 12$$

$$\underline{-2x} + \underline{8} + \underline{3x} - \underline{12}$$

$$\boxed{1x - 4}$$

Sample Problems

Proportions - (cross multiply then divide)

$$\frac{3}{8} = \frac{x}{4}$$

$$8x = 3(4)$$

$$\frac{8x}{8} = \frac{12}{8}$$

$$x = 1.5$$

Equations - (Use inverse operations to isolate the variable.)

$$-(1+4m) = 3(2-m) + 4$$

$$-1 - 4m = 6 - 3m + 4$$

$$-1 - 4m = 10 - 3m$$

$$\quad \quad \quad +3m \quad \quad \quad +3m$$

$$-1 - 1m = 10$$

$$\quad \quad \quad +1 \quad \quad \quad +1$$

$$\frac{-1m}{-1} = \frac{11}{-1}$$

$$m = -11$$

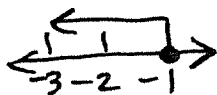
Inequalities - (Solve like an equation but flip symbol if x/\div by a negative #.)

Ex: $-2x + 4 \geq 6$

$$\quad \quad \quad -4 \quad \quad \quad -4$$

Flipped! $\frac{-2x}{-2} \geq \frac{2}{-2}$

$$x \leq -1$$



Finding the Range - (find y)

Ex: $y = 2x - 5$ (domain = -4)

$$y = 2(-4) - 5$$

$$y = -8 - 5$$

$$y = -13$$

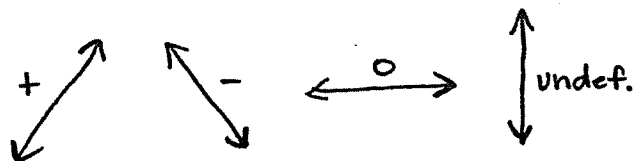
Slope:

Rise

OR

$$\frac{y_2 - y_1}{x_2 - x_1}$$

Run



Graphing Lines in Slope-Int. Form

1st → Plot the y-intercept

2nd → Use slope ($\frac{\text{rise}}{\text{run}}$) to get

other coordinates on the line.

Standard Form → Slope-Int.
(Solve for y. Get the y-alone!)

Ex: $x - 2y = 18$

$$\frac{-2y}{-2} = \frac{-1x + 18}{-2}$$

$$y = \frac{1}{2}x - 9$$

Rising 8th Grade Summer Math

Date _____ Period _____

Evaluate each expression.

1) $(-5) + 10$

- A) 20 B) 1
C) 5 D) -10

2) $2 + (-13)$

- A) -6 B) -11
C) -33 D) 6

3) $(-12) + 5$

- A) -15 B) 4
C) -7 D) -14

4) $(-18) - (-17)$

- A) -13 B) 0
C) -1 D) 23

5) $13 - 5$

- A) 26 B) -9
C) 16 D) 8

6) $20 - (-18)$

- A) 38 B) 31
C) 37 D) 58

7) $(-8) + 6$

- A) 22 B) 19
C) -2 D) -9

8) $5 - (-7)$

- A) -1 B) 0
C) 1 D) 12

9) $10 - 24$

- A) -24 B) -22
C) -21 D) -14

10) $(-17) - 9$

- A) -14 B) -18
C) -26 D) -15

11) $(-15) + 1 - (-9)$

- A) -13 B) -10
C) -8 D) -5

Find each product.

12) $(-6)(-10)$

- A) 70 B) 50
C) 60 D) -60

13) $(3)(-8)$

- A) -34 B) -21
C) -23 D) -24

14) $(-4)(-5)$

- A) 10 B) 20
C) -9 D) 21

15) $(-4)(6)$

- A) 24 B) -34
C) 2 D) -24

16) $(4)(-9)$

- A) -34 B) -36
C) -43 D) -5

Find each quotient.

17) $\frac{-32}{-4}$

- A) -8 B) 0.125
C) -28 D) 8

18) $\frac{81}{-9}$

- A) -729 B) -9
C) 729 D) -7

19) $\frac{30}{-3}$

- A) -10 B) 33
C) 90 D) -7

20) $\frac{-42}{-7}$

- A) -9 B) -35
C) 6 D) 5

Directions: Find each sum, difference, product, or quotient.			
7) $16 + (-12)$	8) $-15 + (-8)$	9) $-27 + 13$	10) $-17 + 31$
11) $10 - 34$	12) $-2 - 30$	13) $10 - (-9)$	14) $-5 - (-17)$
15) $7 - (-19) + 14$	16) $-11 + (-1) + (-23)$	11) $16 - 24 - (-5)$	

TO ADD OR SUBTRACT FRACTIONS, MAKE SURE YOU HAVE A COMMON DENOMINATOR.

30 $\frac{7}{10} + \frac{3}{8}$

31 $2\frac{2}{3} + \frac{5}{4}$

32 $-\frac{2}{5} + 3\frac{1}{10}$

33 $\frac{13}{15} - \frac{2}{3}$

34 $\frac{11}{12} - \frac{7}{8}$

35 $12\frac{1}{3} - \frac{3}{5}$

TO MULTIPLY FRACTIONS, MULTIPLY THE NUMERATORS AND THE DENOMINATORS.

36 $\frac{2}{3} \cdot \frac{3}{5}$

37 $\frac{10}{3} \cdot \frac{39}{4}$

38 $1\frac{5}{6} \cdot 2\frac{2}{9}$

TO DIVIDE FRACTIONS, MULTIPLY BY THE RECIPROCAL. (KISS)

39 $\frac{1}{3} \div \frac{7}{18}$

40 $\frac{4}{5} \div -\frac{1}{15}$

41 $5\frac{4}{9} \div 2\frac{4}{7}$

Topic #6: Order of Operations

Evaluate each expression. Write your answer as a simplified fraction if necessary.

21. $5^2 - (3^3 - 12) \div |-5|$

22. $\frac{\sqrt{64} - 3^3 + 55}{5 + (7 - 4^2)}$

23. $\frac{18 + 2(4 - 1)^3}{9^2 - 21}$

24. $\frac{7}{6} - \frac{9}{5} \cdot \frac{10}{27}$

Directions: Simplify each expression using the order of operations.

42. $6^2 - 20 \div (2^3 - 3) + 1$

43. $17 - (19 - 3^2)^2 \div 4$

44. $\frac{18 - |-2 - 4|}{3 \cdot (4^2 - 11)}$

Topic #7: Evaluating Expressions

Evaluate each expression given the replacement values.

25. $x^3 - 2x^2 + 17$ (if $x = 3$)

26. $a^2 - b^2$ (if $a = -7$ and $b = 4$)

27. $2m^2 - \sqrt{mn} + n^3$ (if $m = 12$ and $n = 3$)

28. $\frac{5}{12}x \div \frac{10}{3}y$ (if $x = -4$ and $y = 6$)

Topic #1: Translating Expressions

Translate each expression.	
1. "One less than the product of four and a number."	2. "Two-thirds of a number increased by seven."
3. "The difference between m and n ."	4. "Nine subtracted from a number squared."
5. "The quotient of twice a number and five."	6. "The sum of one-fourth of a number and 27."

Topic #2: Simplifying & Factoring Expressions

Simplify each expression by distributing and/or combining like terms.		
7. $2(x+9)$	8. $-3(4c-1)$	9. $-(5p+17)$
10. $7a-8-6-2a$	11. $-5-14k-8+19k-k$	12. $-3m+n-2n-6m+17m$
13. $-7(2c+3)+5(c-1)$	14. $2-2(7w-4)+10w$	

Topic #2: Proportional Relationships (Cross multiply then divide.)

Solve the following proportions.		
5. $\frac{5}{3} = \frac{x}{57}$	6. $\frac{14}{x} = \frac{4}{7}$	7. $\frac{1.8}{x} = \frac{9}{3.5}$
8. If it took Max 54 minutes to drive a 60-mile stretch of highway, how long would it take him to drive a 75-mile stretch if he maintains a constant speed?		9. The recreation center is hiring counselors for summer camp. They need four counselors for every 25 campers. If there are 140 campers, how many counselors will they need?

Directions: Solve each equation.

68. $4x - 11 = 41$

69. $15 - 2m = 39$

10. $7(a + 4) = 49$

11. $4(y - 1) - 7y = -46$

12. $9x + 7 = 3x - 5$

13. $8p - 4 = 50 - 10p$

16. $-5x + 8 = 53$

17. $\frac{w-9}{2} = -3$

18. $-9 = -8 + \frac{r}{21}$

19. $6(6 - 6a) = 108$

20. $3 - 7c + 3c = -17$

21. $214 = -3 + 7(-1 + 8s)$

22. $-2(1 + 2d) = 28 + d$

23. $-(1 + 4m) = 3(2 - m) + 4$

24. $7(k + 4) = -1 + 8(k + 2)$

Topic #6: Solving & Graphing Inequalities

Identify each inequality symbol.			
LESS THAN $<$	LESS THAN OR EQUAL TO \leq	GREATER THAN $>$	GREATER THAN OR EQUAL TO \geq

Solve and graph each inequality.	
<p>39. $5x - 9 > 6$</p> <div style="text-align: center;"> </div>	<p>40. $\frac{k-7}{-4} \geq 2$ (Hint: Multiply by -4!) <i>(Handwritten)</i></p> <div style="text-align: center;"> </div>

<p>41. $15v + 32 < 11v - 24$</p> <div style="text-align: center;"> </div>	<p>42. $9(a+1) \leq 3(4a-5)$</p> <div style="text-align: center;"> </div>
--	---

Solve each inequality and check the possible solutions.	
<p>43. $14 - 9x \geq 50$</p> <div style="text-align: right;"> <input type="checkbox"/> -7 <input type="checkbox"/> -6 <input type="checkbox"/> -5 <input type="checkbox"/> -4 <input type="checkbox"/> -3 </div>	<p>44. $\frac{3}{4}(8n - 20) > 39$</p> <div style="text-align: right;"> <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 </div>

Topic #2: Equations as Functions

Given the function and its domain, find the range (y)

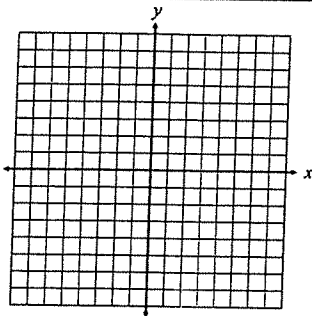
4. $y = -4x + 5$; domain = $\{-7, -1, 2\}$

5. $y = \frac{3}{2}x - 1$; domain = $\{-10, -6, -2\}$

Complete each function table, then graph.

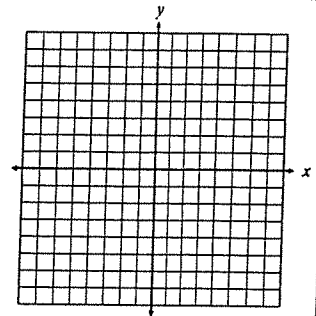
6. $y = -2 - x$

x	y
-5	
-3	
1	
4	



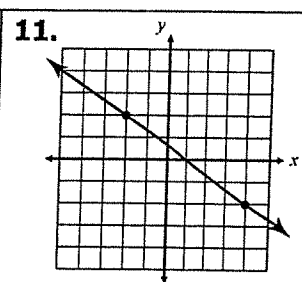
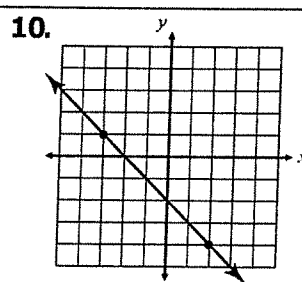
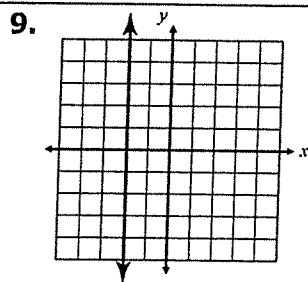
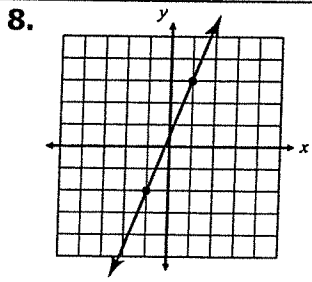
7. $y = 1 - \frac{2}{3}x$

x	y
-6	
-3	
0	
6	



Topic #3: Slope (rise/run)

Find the slope of the line given the graph.



Given any two points (x_1, y_1) and (x_2, y_2) , you can find the slope of the line that passes through the points using the **slope formula**.

SLOPE FORMULA

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope of the line that passes through the given points.

12. $(2, -1)$ and $(-2, -9)$
 x_1, y_1 x_2, y_2

13. $(7, 3)$ and $(2, 3)$

14. $(4, -3)$ and $(-11, 9)$

15. $(-4, 6)$ and $(-4, 7)$

Topic #4: Graphing Linear Equations: Slope-Intercept Form, Standard Form, Vertical & Horizontal Lines

Linear equations are often written in **slope-intercept form** where m is the slope and b is the y -intercept

SLOPE-INTERCEPT FORM

$$y = mx + b$$

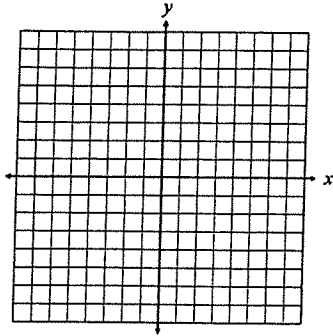
slope \downarrow \downarrow y -intercept

Identify the slope and y -intercept, then graph the equation.

19. $y = 3x - 1$

$m =$

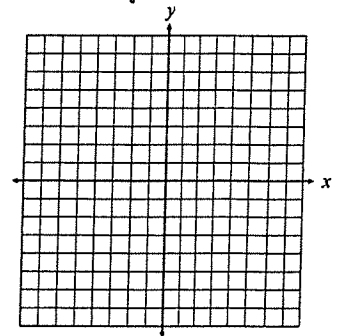
$b =$



20. $y = -x + 7$

$m =$

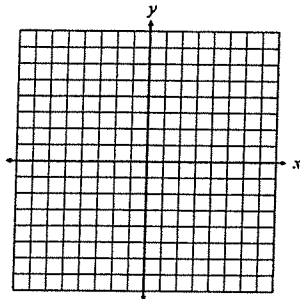
$b =$



21. $y = \frac{2}{5}x - 4$

$m =$

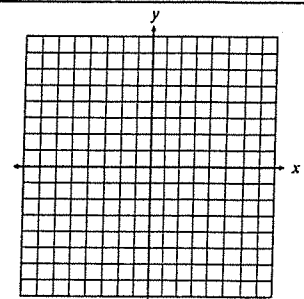
$b =$



22. $y = -\frac{1}{3}x$

$m =$

$b =$



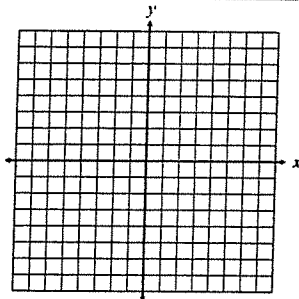
Linear equations are also often written in **standard form**. You can convert these to slope-intercept form by solving for y .

STANDARD FORM

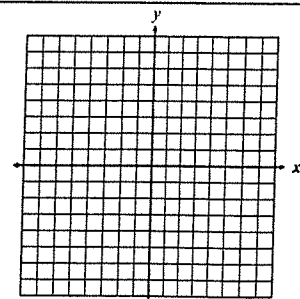
$$Ax + By = C$$

Write the equation in slope-intercept form, then graph.

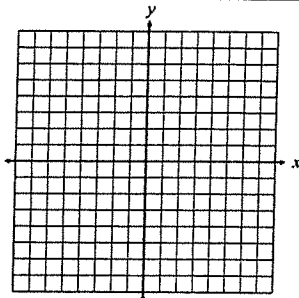
23. $x + 5y = 10$



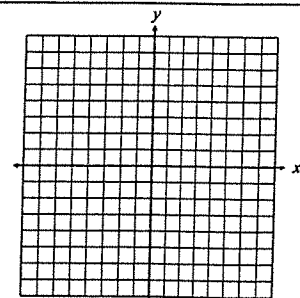
24. $x - y = 3$



25. $8x - 6y = -6$

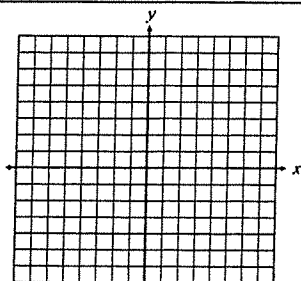


26. $x - 2y = 14$



Graph each line.

27. $x = -1$



28. $y = 6$

