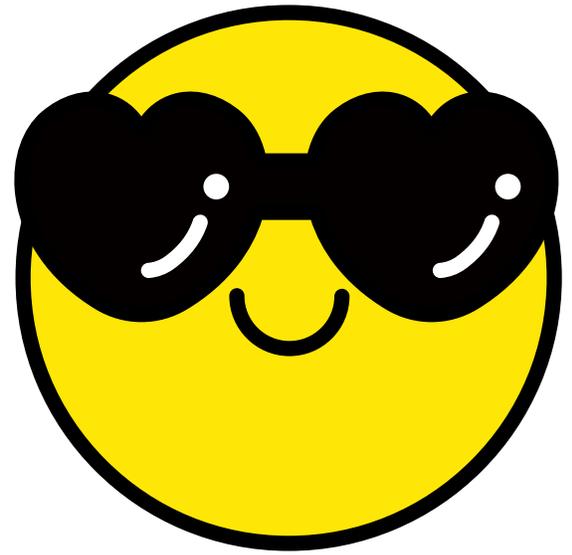


RISING 8TH GRADE EDITION



DAM GOOD MATH

A super fun summer math workbook
for **Beaver Middle School** students



This book belongs to ...

Hi, students!

It's no secret we ❤️❤️❤️ math, so we created this fun workbook for you to work on throughout the summer. While this work is optional, we hope you explore the following pages. You'll notice all of the topics are review; we did this on purpose!

As you know, math at Beaver is all about *investigating* and *discovering* new ideas together. The best way to ensure you are ready to collaborate and explore new math next year is by spending a little time this summer to keep these topics in your toolkit.

You can sit and do the workbook all at once—or you can do a problem here and a problem there.

However, wherever, whenever! It's as easy as π .

Now, go have a DAM good summer! 😎

- *The MS Math Team*



Rising 8th Grade Summer Math Practice

- However, wherever, whenever! The guide below will help you start and ensure it all gets done before school starts!
- Leave out the calculator. You won't need it!

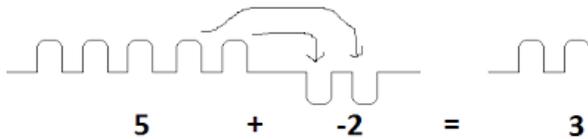
Suggested Date	Topic
Week 1 June 16 - 20	1. Operations with Integers and Order of Operations
Week 2 June 23 - 27	2. Operations with Rational Numbers
Week 3 June 30 - July 4	3. Algebraic Expressions
Week 4 July 7 - 11	4. Proportions and Rates
Week 5 July 14 - 18	5. Percentages
Week 6 July 21 - 25	6. Coordinate Plane
Week 7 July 28 - August 1	7. 1 and 2 step Equations
Week 8 August 4 - 8	8. Equations with Variables on Both Sides
Week 9 August 11 - 15	9. Linear Relationships
Week 10 August 18 - 22	Take this time to complete any work in this packet that is not complete. Complete the Student and Parent Reflections.
FIRST DAY OF SCHOOL September 2nd	Give your Summer Math Practice to Ms. O'Dowd, receive a 🎁 !



Reminders!

Integer Addition

Think about piles and holes!



Integer Subtraction

SUBTRACTION EQUALS ADDING THE OPPOSITE

$$\oplus - \oplus \text{ changes to } \oplus + \ominus$$

$$\oplus - \ominus \text{ changes to } \oplus + \oplus$$

$$\ominus - \oplus \text{ changes to } \ominus + \ominus$$

$$\ominus - \ominus \text{ changes to } \ominus + \oplus$$

Multiplying and Dividing Integers

Multiplying Integers Rules

$$\oplus \times \oplus = \oplus$$

$$\ominus \times \ominus = \oplus$$

$$\oplus \times \ominus = \ominus$$

$$\ominus \times \oplus = \ominus$$

Rules for Dividing Integers

$$\oplus \div \oplus = \oplus$$

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Order of Operations

G. E. (M. D.) (A. S.)

1	G	Grouping Symbols { braces [brackets (parenthesis) } absolute value division bar √ square root
2	E	Exponents x!
3	M/D	Multiplication or Division Do the one on the *left* first!
4	A/S	Addition or Subtraction Do the one on the *left* first!

$$\begin{aligned}
 3 + 2^3 + 5(4 - 7) &= 3 + 2^3 + 5(-3) \\
 &= 3 + 8 + 5(-3) \\
 &= 3 + 8 - 15 \\
 &= 11 - 15 \\
 &= -4
 \end{aligned}$$



TOPIC 1:

Operations with integers and order of operations

1) $-10 + (-5) =$

2) $-4 + 11 =$

3) $-10 - (-5) =$

4) $4 + (-8) + (-2) =$

5) $-5 * (-2) * 3 =$

6) $-8 - (-3) - 4 =$

7) $\frac{-48}{12} =$

8) $\frac{-4(3)}{2(-3)} =$

9) $-36 \div (-4) =$

10) $-7 \cdot 4 + 8 \div 2$

11) $8 \cdot (4 - 5) + 3$

12) $-8 \cdot [4 + (-5 + 3)]$

13) $\frac{-4(4)}{-8 + 2^3 * 3}$



Reminders!

Adding & Subtracting Decimals

Write the problem vertically, lining up the decimal points.

Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.

Add/subtract as if the numbers are whole numbers.

Bring the decimal point straight down

ex: $14.2 - 7.934$

$$\begin{array}{r} 14.200 \\ - 7.934 \\ \hline 6.266 \end{array}$$

Adding Fractions & Mixed Numbers

Find a common denominator for the two fractions.

Add the two numerators and keep the denominators the same.

Add the whole numbers.

Simplify the answer.

ex: $3\frac{3}{4} + 2\frac{1}{2}$

$$\begin{array}{r} 3\frac{3}{4} = 3\frac{3}{4} \\ + 2\frac{1}{2} = 2\frac{2}{4} \\ \hline 5\frac{5}{4} = 6\frac{1}{4} \end{array}$$

Subtracting Fractions & Mixed Numbers

Find a common denominator for the two fractions.

Subtract the two numerators and keep the denominators the same. If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.

Subtract the whole numbers.

Simplify the answer.

ex: $5\frac{1}{4} - 1\frac{2}{3}$

$$\begin{array}{r} 5\frac{1}{4} = 4\frac{3}{4} = 4\frac{9}{12} \\ - 1\frac{2}{3} = 1\frac{8}{12} \\ \hline 3\frac{1}{12} \end{array}$$



TOPIC 2 PART 1

Adding and Subtracting Rational Numbers

1. $\frac{7}{12} - \left(-\frac{1}{8}\right)$

2. $-\frac{9}{10} - \frac{2}{5}$

3. $1\frac{7}{8} - \left(-3\frac{1}{12}\right)$

4. $-2\frac{5}{6} + 4\frac{1}{4}$

5. $3.7 + [-0.5]$

6. $0.4 + [-0.7]$

7. $-4.12 - 2.6$

8. $1.2 - 8.5$



Reminders!

Multiplying Decimals

Write the problem vertically with the numbers lined up to the right. The decimals **do not need** to be lined up.

Ignore the decimals and multiply as if the numbers are whole numbers.

Count the total number of decimal places in the factors and put a decimal point in the product so that it has the same number of decimal places.

ex: 6.94×7.8

$$\begin{array}{r} 6.94 \rightarrow 2 \text{ decimal places} \\ \times 7.8 \rightarrow 1 \text{ decimal place} \\ \hline + 5552 \\ 48580 \\ \hline 54132 \end{array}$$

3 decimal places

$\boxed{54.132}$

Dividing Decimals

Write the dividend under the long division symbol and the divisor to the left of it.

Multiply the divisor and dividend by the same power of ten so that the dividend becomes a whole number. Bring the decimal up from the divisor.

Divide as if the numbers are both whole numbers.

Add zeros in the dividend as needed until there is no remainder.

ex: $25.3 \div 0.3$

$$\begin{array}{r} \boxed{84.3} \\ 0.3 \overline{) 25.30} \\ \underline{-24} \\ 13 \\ \underline{-12} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

Multiplying and Dividing Fractions

Turn any mixed numbers into improper fractions.

Cross-simplify when possible.

When dividing, remember to switch the second fraction to its reciprocal.

Multiply the numerators and multiply the denominators.

ex: $2\frac{1}{6} \cdot \frac{4}{7}$

$$\frac{13}{3\cancel{6}} \cdot \frac{\cancel{4}^2}{7} = \frac{26}{21} = \boxed{1\frac{5}{21}}$$

ex: $7 \div 1\frac{3}{4}$

$$\begin{array}{r} 7 \div 1\frac{3}{4} \\ \downarrow \\ 7 \cdot \frac{4}{\cancel{4}_1} = \frac{4}{1} = \boxed{4} \end{array}$$



TOPIC 2 PART 2

Multiplying and Dividing Rational Numbers

Find each product. NO CALCULATORS. All answers must be in simplest form.

1. $-3.5 \cdot 7$

2. $-\frac{4}{9} \cdot \left(-\frac{2}{5}\right)$

3. $-\frac{2}{3} \cdot 2\frac{3}{4}$

4. $-2\frac{2}{9} \cdot \left(-1\frac{1}{8}\right)$

5. $-1.3 \cdot 0.6$

6. $4\frac{2}{3} \cdot [-3]$



Find each quotient. NO CALCULATORS. All answers must be in simplest form.

7. $\frac{-3}{5} \div \left(\frac{-1}{3}\right)$

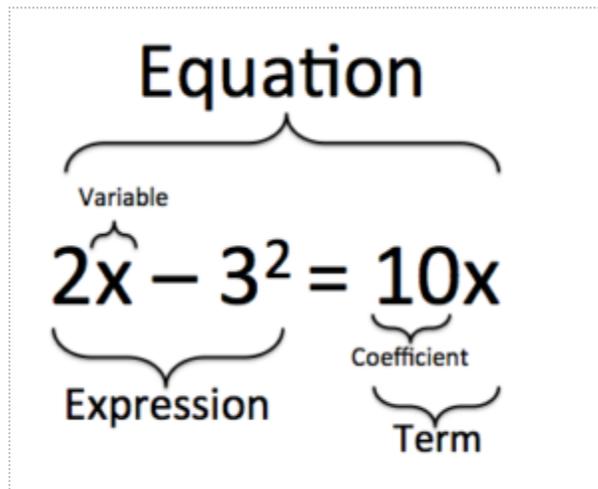
8. $34.4 \div [-8]$

9. $-6.54 \div 0.3$

10. $-1\frac{3}{8} \div \left(\frac{-5}{6}\right)$



Reminders!



Evaluating Algebraic Expressions

Substitute the given numbers for the variables.

Evaluate the expression using the order of operations

ex: evaluate $x + 4y$ for
 $x = 4$ & $y = 6$

$$\begin{aligned} &4 + 4(6) \\ &4 + 24 = \boxed{28} \end{aligned}$$

Combining Like Terms

$$5x + 9 + 2x$$

$$\left. \begin{aligned} 5x + 2x &= 7x \\ 9 &= 9 \end{aligned} \right\} \boxed{7x + 9}$$

Distributive Property

$$6(x + 2) = \boxed{6x + 12}$$



TOPIC 3

Algebraic Expressions

1) $30n + 8n$

2) $7x + 31x$

3) $10x + 36 - 38x - 47$

4) $-2(7 - n) + 4$

5) $-8(-5b + 7) + 5b$

6) $-4p - (1 - 6p)$

7) $4 - 5(-4n + 3)$

8) $-7(k - 8) + 2k$

Use your simplified expression
and evaluate when $n = -1$

Use your simplified expression and
evaluate when $k = 3$



Reminders!

Proportions and Rates

Two examples of solving proportions by cross-multiplication are shown within a dotted border. The first example shows the equation $\frac{x}{9} = \frac{2}{3}$. A green arrow labeled 'x3' points from the denominator 9 to the numerator 2, and another green arrow labeled 'x3' points from the denominator 3 to the numerator x. Below the equation, the solution $x = 3$ is written and boxed in green. The second example shows the equation $\frac{4}{12} = \frac{x}{39}$. A green arrow labeled '÷3' points from the denominator 12 to the denominator 39, and another green arrow labeled '÷3' points from the numerator 4 to the numerator x. Below the equation, the solution $x = 13$ is written and boxed in green.

Problem-Solving With Proportions

Teresa is maintaining a campfire. She can keep the fire burning for 4 hours with 6 logs. She wants to know how many logs she needs to keep the fire burning for hours. She assumes all logs are the same.

How many logs does Teresa need to maintain the fire for 18 hours?

Labels

$$\begin{array}{l} \text{Logs} \rightarrow \\ \text{Hours} \rightarrow \end{array} \frac{6}{4} = \frac{x}{18}$$

The equation shows a proportion with labels. The top fraction is $\frac{6}{4}$ and the bottom fraction is $\frac{x}{18}$. A red arrow labeled 'x4.5' points from the denominator 4 to the denominator 18. Another red arrow labeled 'x4.5' points from the numerator 6 to the numerator x.

$$x = 27$$

She needs 27 logs to maintain the fire for 18 hours.



TOPIC #4

Proportions and Rates

Solve the following proportions:

$\frac{x}{45} = \frac{3}{5}$	$\frac{10}{8} = \frac{n}{12}$	$\frac{9}{6} = \frac{n}{15}$
$\frac{m}{5} = \frac{7}{2}$	$\frac{7}{4} = \frac{r}{5}$	$\frac{9}{5} = \frac{x}{3}$

Ted likes to run long distances. He can run 20 km in 95 minutes. If he runs at the same pace, how far will he run in 285 minutes?

Maddy is carrying a 5 liter jug of sports drink that weighs 75 kg. Assuming the relationship between volume and weight is proportional, what is the weight of the 2 liter jug?



Reminders!

Benchmark Percents

100%	32
1%	0.32
2%	$0.32 * 2 = 0.64$
5%	$3.2 \div 2 = 1.6$
10%	3.2
20%	$3.2 * 2 = 6.4$
27%	$6.4 + 1.6 + 0.64 = 8.64$

Percent of a Number

What is 35% of 80?

$$\frac{35}{100} \times 80 = 28$$

$$0.35 \times 80 = 28$$

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$



Topic #5

Percents

Convert to a decimal:

1. 75%	2. 7%
3. 93%	4. 105%

Find the following percents:

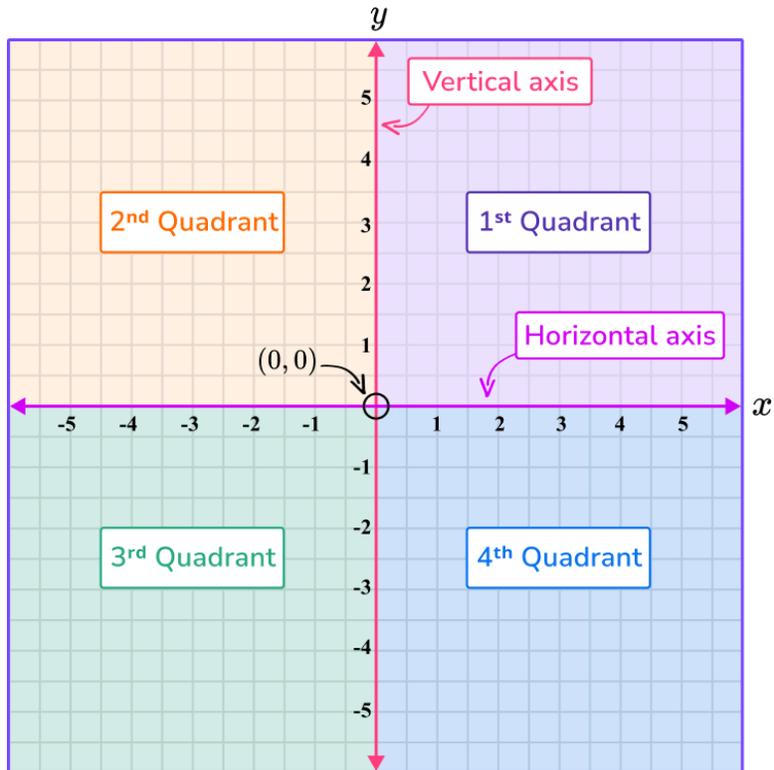
5. 15% of 54	6. 23% of 40
7. 3% of 22	8. 115% of 20

9. A writer earns \$3400 a month. Last month, she spent \$204 on food. What percent of her income was spent on food?



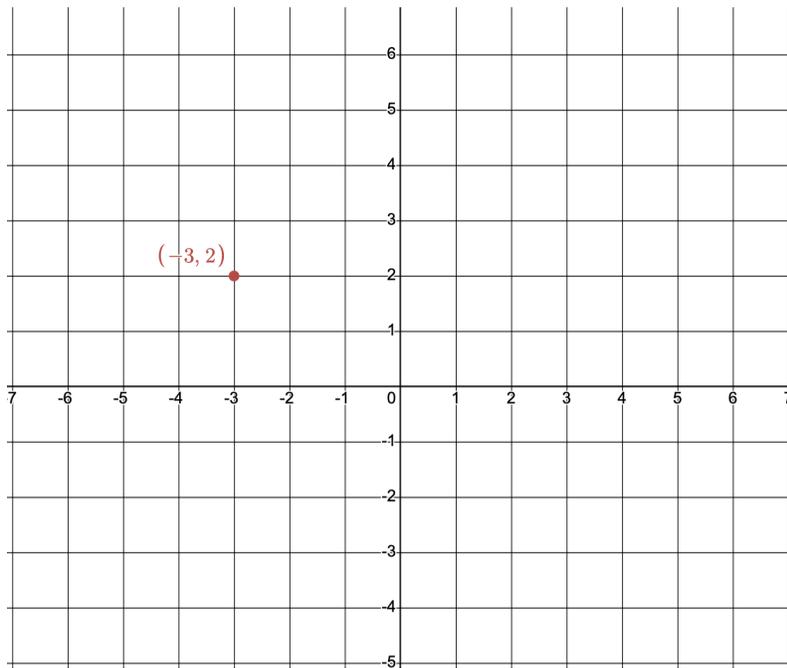
Reminders!

Coordinate Plane



Graphing a Point:

Example $(-3, 2)$. Start at the origin $(0, 0)$. Move left 3 units and up 2 units.

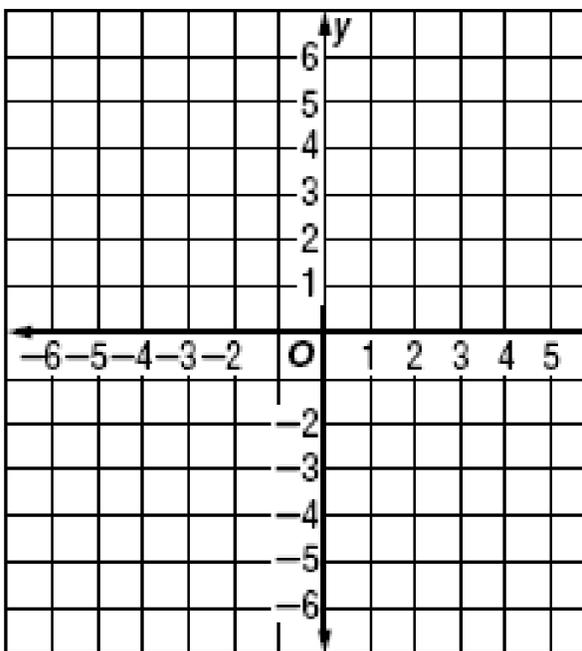
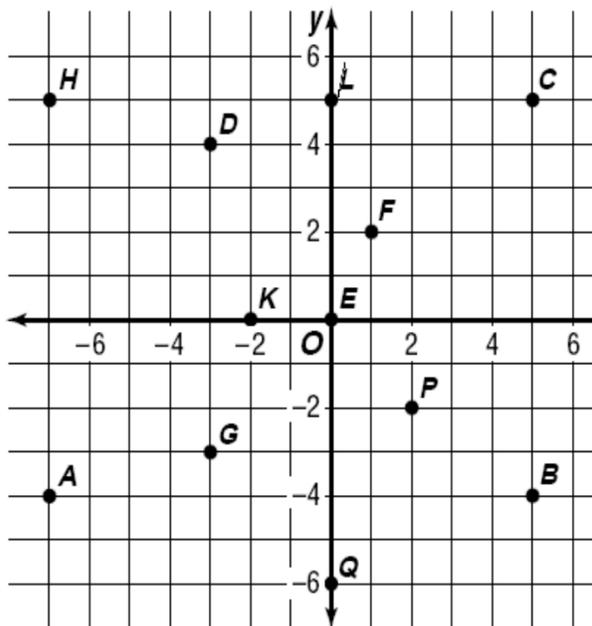


TOPIC 6

Coordinate Plane

Write the ordered pair for each point *and* name the quadrant it's located in.

1. H _____
2. F _____
3. G _____
4. E _____
5. A _____
6. B _____
7. Q _____
8. C _____



Label the four quadrants.

Label the origin.

Graph and label the following:

- W(- 3, 0)
- I(- 2, - 3)
- N(0, 4)
- T(- 1, 2)
- E(6, - 2)
- R(- 5, - 6)



Reminders!

1- and 2-Step Equations

Properties of Equality

- To solve an equation, work backwards and use inverse operations.
- Apply the same move to both sides of the equation.

1. $x + 3 = 10$ $\boxed{-3}$ $\boxed{-3}$ $x = 7$	2. $x - 5 = 2$ $\boxed{+5}$ $\boxed{+5}$ $x = 7$
3. $9x = 18$ $\boxed{\div 9}$ $\boxed{\div 9}$ $x = 2$	4. $\frac{x}{7} = 10$ $\boxed{\times 7}$ $\boxed{\times 7}$ $x = 70$

Solve 2-Step Equations: Apply properties of equality to isolate the variable.

	$-3x + (-2) = -17$
<i>Adding Integers</i>	$\quad\quad\quad +2 \quad\quad +2$
	<hr/>
<i>Solve One-Step Equations</i>	$-3x = -15$
<i>Dividing Integers</i>	$\div (-3) \quad \div (-3)$
	<hr/>
	$x = 5$



TOPIC 7

Solving 1- and 2-Step Equations

1. $\frac{x}{5} = 11$

2. $-4x = 20$

3. $3x + 5 = 26$

4. $2x - 9 = 11$

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

6. $7 - x = 10$

7. $\frac{x}{-5} + 3 = 2$

8. $2(x + 5) = 10$



Reminders!

Equations with Variables on Both Sides

- Combine like terms on each side of the equation first.
- Move all variables to one side of the equation using properties of equality.
- Move all constants to the other side of the equation.
- Isolate the variable

Example:

SOLVE FOR X:

$$15 + 6x = 45 + 8x$$

$$15 + 6x = 45 + 8x$$

$$-6x \quad -6x$$

$$15 = 45 + 2x$$

$$-45 \quad -45$$

$$\underline{-30} = \underline{2x}$$

$$\underline{2} \quad \underline{2}$$

$$\boxed{-15 = x}$$

Check your answer:

$$15 + 6(-15) \stackrel{?}{=} 45 + 8(-15)$$

$$15 + (-90) \stackrel{?}{=} 45 + (-120)$$

$$-75 = -75 \quad \checkmark$$



Topic 8

Solving Equations with Variables on Both Sides

1. $-3 + 5a = 4a - 10$

2. $-2k = k - 15$

3. $-16 + 3n = -8 - 5n$

4. $1 - 3x = 3x + 1$

5. $4r + 8 + 5 = -15 - 3r$

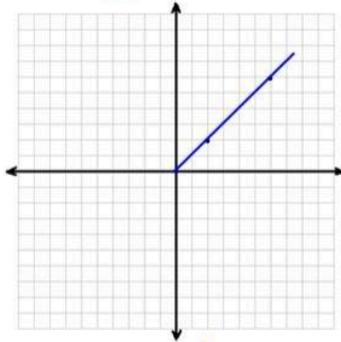
6. $4n - 1 = 6n + 8 - 8n + 15$



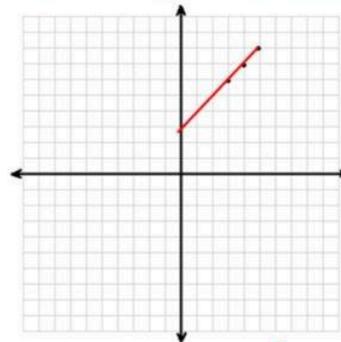
Reminders!

Linear Relationships

Proportional



Non-Proportional



Writing

Equations From Tables

$$y = mx + b$$

$$m = \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x}$$

$$b = y - \text{intercept (where } x = 0)$$

x	y
0	-3
1	0
2	3
3	6
4	9

Handwritten annotations: Blue arrows on the left show a constant increase of +1 in x. Blue arrows on the right show a constant increase of +3 in y. A blue circle highlights the x=0 value, and a blue arrow points from it to the y=-3 value.

$$m = \frac{3}{1} \quad b = -3$$

$$y = 3x - 3$$

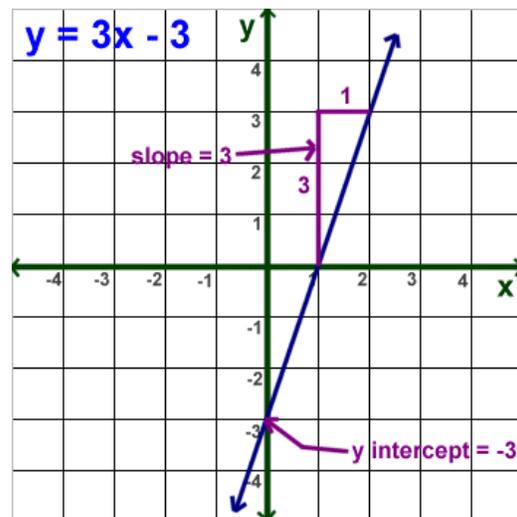
Writing

Equations From Graphs

$$y = mx + b$$

$$m = \text{slope} = \frac{\text{rise}}{\text{run}}$$

$$b = y - \text{intercept (where the line hits the } y\text{-axis)}$$



TOPIC 9

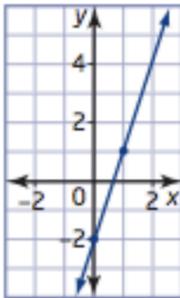
Linear Relationship

1. Identify the slope and the y-intercept of each line:

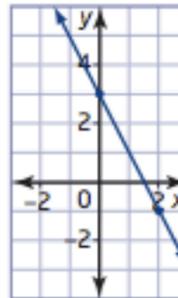
Equation	Slope	y-intercept
a) $y = 4x + 1$		
b) $y = \frac{2}{3}x + 3$		
c) $y = x - 2$		
d) $y = -\frac{2}{3}x$		
e) $y = 3$		
f) $y = -x - \frac{1}{2}$		

2. Find the slope and y-intercept of each line:

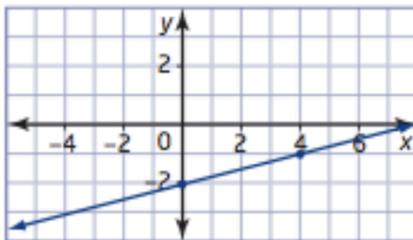
a)



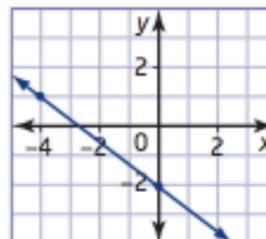
b)



c)



d)



Student Reflection

1. How would you rate the difficulty of the problems in general throughout the summer break packet? Please rate on a scale from 1-10, with 1 being the easiest and 10 being the hardest.

1 2 3 4 5 6 7 8 9 10

2. What types of problems in the packet were the most difficult and why?
3. What types of problems in the packet were the easiest and why?
4. When did you complete the packet? How did you pace yourself when completing the packet? [Did you do it every day, once a week, all of it crammed into a few days?]
5. List at least 3 goals you have for 8th-grade math.

1. _____

2. _____

3. _____

6. Explain how you plan to achieve those goals.



Family Reflection

1. How difficult did you feel this summer math packet was for your student? Was it too easy or too difficult or somewhere in the middle?
2. How much help did you give your child in completing this packet?
3. What would you say was the most difficult thing about the summer math packet?



YAY!
YOU DID IT!



CHECK YOUR WORK!

Scan the QR code or go to
<http://q-r.to/BVRMath8th>
for the Answer Key.

