

Greetings Rising 8th Grader and Welcome to Math 8!

The purpose of this summer school packet of mathematics problems is to provide you the opportunity to review material that you may have learned last year, to give you a great start to the upcoming 2022 - 2023 school year.

We want to encourage you to at least try some of the problems. And, you can work on this packet in one sitting, or do some problems one day, and come back to other problems on other days; it is completely up to you! Instead, try to do one or two problems a day.

We hope that you have a wonderful summer and are looking forward to the upcoming school year.

Sincerely,

Montgomery County Public Schools Secondary Mathematics Team

## Rising 8<sup>th</sup> Grade Summer Review Packet

1. A certain shade of pink is created by adding 3 cups of red paint to 7 cups of white paint.

a) How many cups of red paint should be added to 1 cup of white paint?

cups of white paint	cups of red paint
1	
7	3

b) What is the constant of proportionality?

2. Select **all** the ratios that are equivalent to each other.

A. 4:7

B. 8:15

C. 16:28

D. 2:3

E. 20:35



3. A certain ceiling is made up of tiles. Every square meter of ceiling requires 10.75 tiles. Fill in the table with the missing values.

square meters of ceiling	number of tiles
1	
10	
	100
$a$	

4. A store sells rope by the meter. The equation  $p = 0.8L$  represents the price  $p$  (in dollars) of a piece of nylon rope that is  $L$  meters long.

a) How much does the nylon rope cost per meter?

b) How long is a piece of nylon rope that costs \$1.00?



5. Elena has some bottles of water that each holds 17 fluid ounces.

a) Write an equation that relates the number of bottles of water ( $b$ ) to the total volume of water ( $w$ ) in fluid ounces.

b) How much water is in 51 bottles?

c) How many bottles does it take to hold 51 fluid ounces of water?

6. Decide whether each table could represent a proportional relationship. If the relationship could be proportional, what would the constant of proportionality be?

a) How loud a sound is depending on how far away you are.

distance to listener (ft)	sound level (dB)
5	85
10	79
20	73
40	67



b) The cost of fountain drinks at Hot Dog Hut.

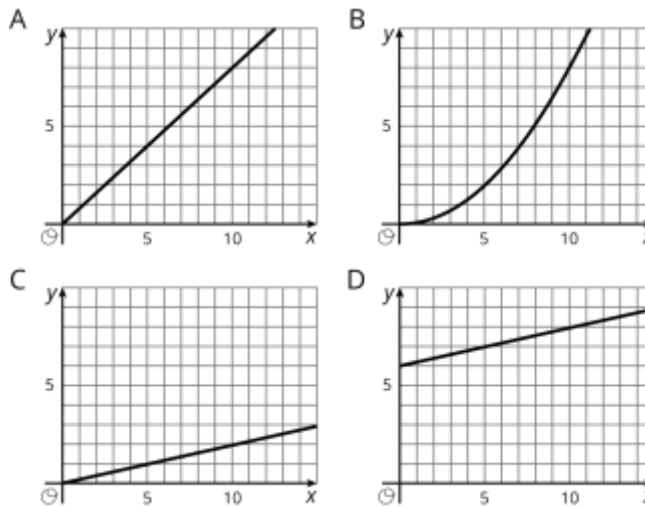
volume (fluid ounces)	cost (\$)
16	\$1.49
20	\$1.59
30	\$1.89

7. A rabbit and turtle are in a race. Is the relationship between distance traveled and time proportional for either one? If so, write an equation that represents the relationship.

Turtle's run:		Rabbit's run:	
distance (meters)	time (minutes)	distance (meters)	time (minutes)
108	2	800	1
405	7.5	900	5
540	10	1,107.5	20
1,768.5	32.75	1,524	32.5



8. Which graphs could represent a proportional relationship?



a) A

b) B

c) C

d) D

9. A lemonade recipe calls for  $\frac{1}{4}$  cup of lemon juice for every cup of water.

a. Use the table to answer these questions.

i. What does  $x$  represent?

ii. What does  $y$  represent?

iii. Is there a proportional relationship between  $x$  and  $y$ ?

b. Plot the pairs in the table in a coordinate plane.

$x$	$y$
1	$\frac{1}{4}$
2	$\frac{1}{2}$
3	$\frac{3}{4}$
4	1



10. Lin and Andre biked home from school at a steady pace. Lin biked 1.5 km and it took her 5 minutes. Andre biked 2 km and it took him 8 minutes.

a) Draw a graph with two lines that represent the bike rides of Lin and Andre.

b) For each line, highlight the point with coordinates  $(1, k)$  and find  $k$ .

c) Who was biking faster?



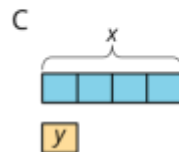
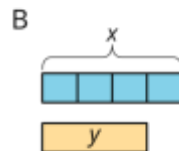
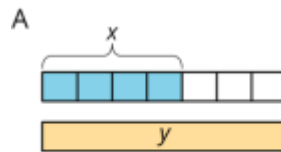
11. Match each equation to its graph.

<p>a) <math>y = 2x</math></p> <p>b) <math>y = \frac{4}{5}x</math></p> <p>c) <math>y = \frac{1}{4}x</math></p> <p>d) <math>y = \frac{2}{3}x</math></p> <p>e) <math>y = \frac{4}{3}x</math></p> <p>f) <math>y = \frac{3}{2}x</math></p>	<p>1</p>	<p>2</p>
	<p>3</p>	<p>4</p>
	<p>5</p>	<p>6</p>





12. Match each situation with a diagram.



<p>A. Diagram A</p> <p>B. Diagram B</p> <p>C. Diagram C</p>	<p>1. Diego drank <math>x</math> ounces of juice. Lin drank <math>\frac{1}{4}</math> less than that.</p> <p>2. Lin ran <math>x</math> miles. Diego ran <math>\frac{3}{4}</math> more than that.</p> <p>3. Diego bought <math>x</math> pounds of almonds. Lin bought <math>\frac{1}{4}</math> of that.</p>
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13. At the beginning of the month, there were 80 ounces of peanut butter in the pantry. Since then, the family ate 0.3 of the peanut butter. How many ounces of peanut butter are in the pantry now?

a)  $0.7 \cdot 80$

b)  $0.3 \cdot 80$

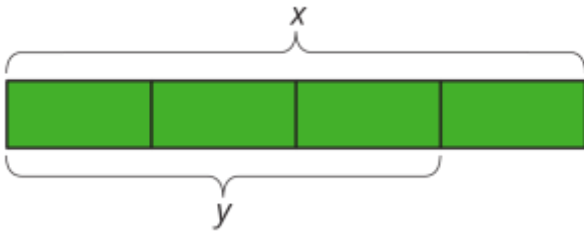
c)  $80 - 0.3$

d)  $(1 + 0.3) \cdot 80$

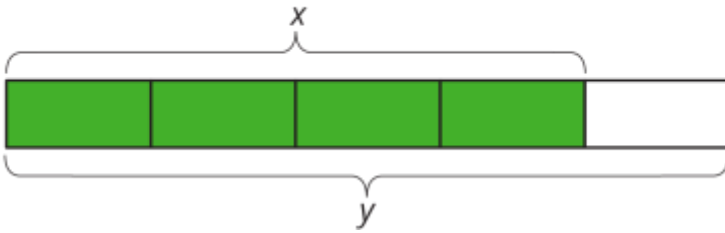


14. For each diagram, decide if  $y$  is an increase or a decrease relative to  $x$ . Then determine the percent increase or decrease.

A



B



15. Last week, the price of oranges at the farmer's market was \$1.75 per pound. This week, the price has decreased by 20%. What is the price of oranges this week?



16. a) The temperature is  $-2^{\circ}\text{C}$ . If the temperature rises by  $15^{\circ}\text{C}$ , what is the new temperature?

b) At midnight the temperature is  $-6^{\circ}\text{C}$ . At midday the temperature is  $9^{\circ}\text{C}$ . By how much did the temperature rise?

17. One of the particles in an atom is called an electron. It has a charge of  $-1$ . Another particle in an atom is a proton. It has charge of  $+1$ . The charge of an atom is the sum of the charges of the electrons and the protons. A carbon atom has an overall charge of  $0$ , because it has  $6$  electrons and  $6$  protons and  $-6 + 6 = 0$ . Find the overall charge for the rest of the elements on the list.

	charge from electrons	charge from protons	overall charge
carbon	$-6$	$+6$	$0$
neon	$-10$	$+10$	
oxide	$-10$	$+8$	
copper	$-27$	$+29$	
tin	$-50$	$+50$	



18. Write each subtraction equation as an addition equation.

a)  $a - 9 = 6$

b)  $p - 20 = -30$

c)  $z - (-12) = 15$

d)  $x - (-7) = -10$

19. a) What is the difference in height between 30 m up a cliff and 87 m up a cliff? What is the distance between these positions?

b) What is the difference in height between an albatross flying at 100 m above the surface of the ocean and a shark swimming 30 m below the surface? What is the distance between them if the shark is right below the albatross?



20. Find the value of each expression.

a)  $16.2 + -8.4$

b)  $\frac{2}{5} - \frac{3}{5}$

c)  $-9.2 + -7$

d)  $-4\frac{3}{8} - (-1\frac{1}{4})$



21. A weather station on the top of a mountain reports that the temperature is currently  $0^{\circ}\text{C}$  and has been falling at a constant rate of  $3^{\circ}\text{C}$  per hour. If it continues to fall at this rate, find each indicated temperature. Explain or show your reasoning.

a) What will the temperature be in 2 hours?

b) What will the temperature be in 5 hours?

c) What will the temperature be in half an hour?

d) What was the temperature 1 hour ago?

e) What was the temperature 3 hours ago?



22. Find the value of each expression.

a)  $\frac{1}{4} \cdot (-12)$

b)  $(-\frac{4}{5}) \cdot (-75)$

c)  $-\frac{2}{5} \cdot (-\frac{3}{4})$

23. A submarine is only allowed to change its depth by rising toward the surface in 60-meter stages. It starts off at -340 meters.

a) At what depth is it after:

i. 1 stage

ii. 2 stages

iii. 4 stages



b) How many stages will it take to return to the surface?

24. Some boats were traveling up and down a river. A satellite recorded the movements of several boats.

a) A motor boat traveled -3.4 miles per hour for 0.75 hours. How far did it go?

b) A tugboat traveled -1.5 miles in 0.3 hours. What was its velocity?

c) What do you think that negative distances and velocities could mean in this situation?

25. The value of  $x$  is  $\frac{-1}{4}$ . Order these expressions from least to greatest:

a)  $x$

b)  $1 - x$

c)  $x - 1$

d)  $-1 \div x$

