Algebra 1

SUMMER

ASSIGNMENTS

Montgomery County Public Schools

Greetings, Rising Algebra 1 student!

This summer school packet of mathematics problems aims to review math content you may have learned last year to give you a great start to the upcoming school year.

We encourage you to try some of the problems. You can work on this packet in one sitting, do a few one day, and return to other problems on other days; it is entirely up to you! Our recommendation is to try to do one or two per day.

We hope you have a wonderful summer and look forward to the upcoming school year.

Sincerely,

Montgomery County Public Schools Secondary Mathematics Team

Rising Algebra 1 Summer Review Packet

1. Segment AB measures 3 cm. The point O is the center of dilation. How long is the image of AB after a dilation with:

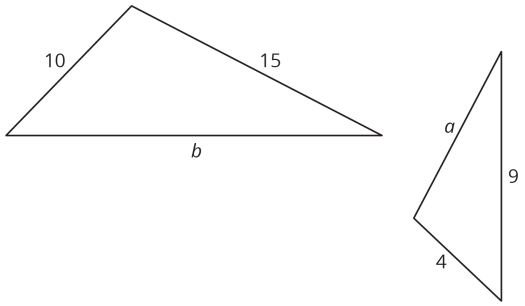
a) Scale factor 5?

b) Scale factor 3.7?

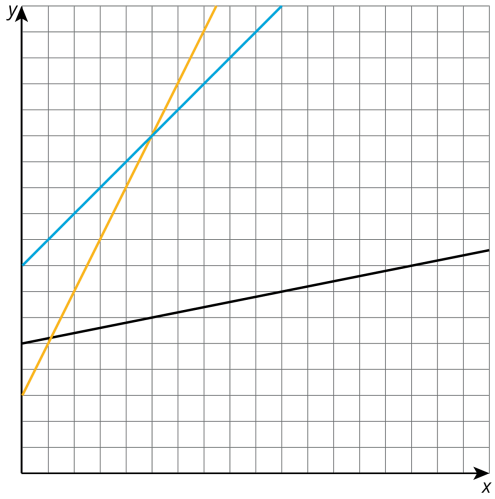
c) Scale factor $\frac{1}{5}$?

d) Scale factor s?

2. These two triangles are similar. What are a and b? Note: the two figures are not drawn to scale.



3. Of the three lines in the graph, one has slope 1, one has slope 2, and one has slope $\frac{1}{5}$. Label each line with its slope.



4. For each pair of points, find the slope of the line that passes through both points. If you get stuck, try plotting the points on graph paper and drawing the line through them with a ruler.

a) (1, 1) and (7, 5)

b) (1, 1) and (5, 7)

c) (2, 5) and (− 1, 2)

d) (2, 5) and (− 7, − 4)

5. Select **all** the points that are on the line through (0, 5) and (2, 8).

A. (4, 11)

B. (5, 10)

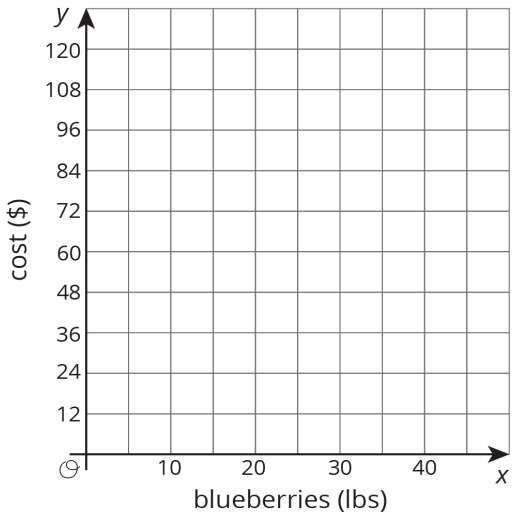
C. (6, 14)

D. (30, 50)

E. (40, 60)

6. A you-pick blueberry farm offers 6 lbs of blueberries for $16.50.

Sketch a graph of the relationship between cost and pounds of blueberries.

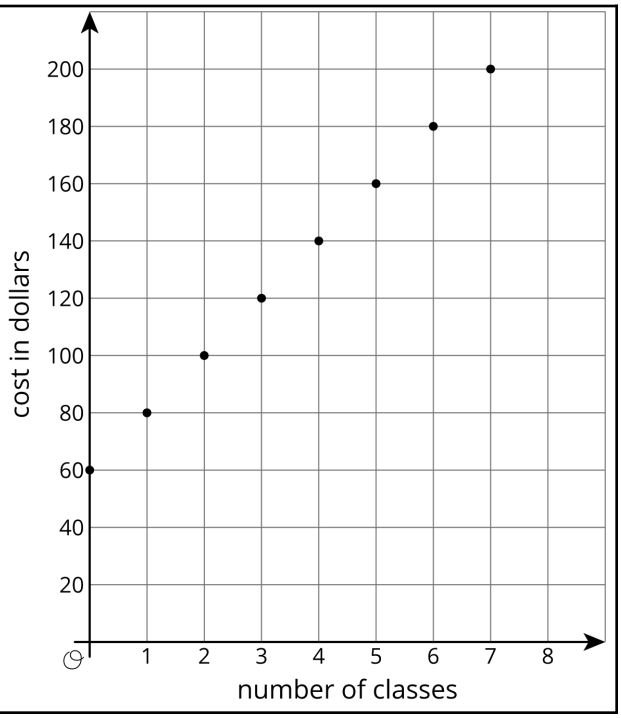


7. A restaurant offers delivery for their pizzas. The total cost is a delivery fee added to the price of the pizzas. One customer pays $25 to have 2 pizzas delivered. Another customer pays $58 for 5 pizzas. How many pizzas are delivered to a customer who pays $80?

8. Customers at the gym pay a membership fee to join and then a fee for each class they attend. Here is a graph that represents the situation.

a) What does the slope of the line shown by the points mean in this situation?

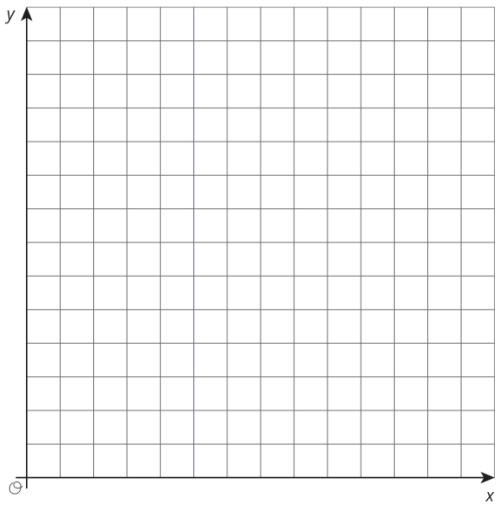
b) What does the vertical intercept mean in this situation?



9. Create a graph that shows three linear relationships with different y-intercepts using the following slopes, and write an equation for each line.

Slopes:

- $\frac{1}{5}$
- $\frac{3}{5}$
- $\frac{6}{5}$



10. Here are recipes for two different banana cakes. Information for the first recipe is shown in the table.

sugar (cups)	flour (cups)
$\frac{1}{2}$	$\frac{3}{4}$
$2\frac{1}{2}$	$3\frac{3}{4}$
3	$4\frac{1}{2}$

The relationship between cups of flour y and cups of sugar x in the second recipe is $y = \frac{7}{4}x$

a) If you used 4 cups of sugar, how much flour does each recipe need?

b) What is the constant of proportionality for each situation and what does it mean?

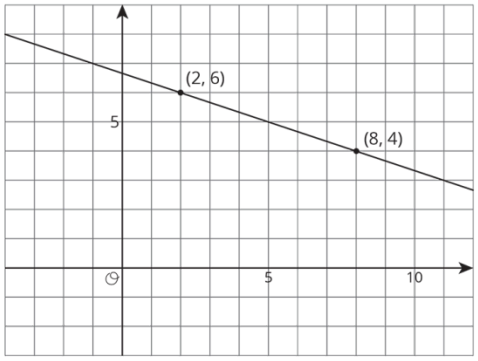
11. Select **all** the equations that have graphs with the same y-intercept.

A. $y = 3x - 8$ B. $y = 3x - 9$ C. $y = 3x + 8$

D. $y = 5x - 8$ E. $y = 2x - 8$ F. $y = \frac{1}{3}x - 8$

12. For each graph, calculate the slope of the line.

A



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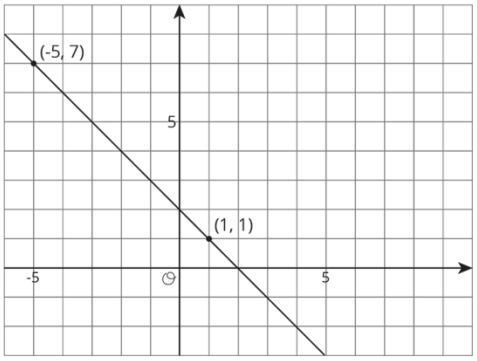
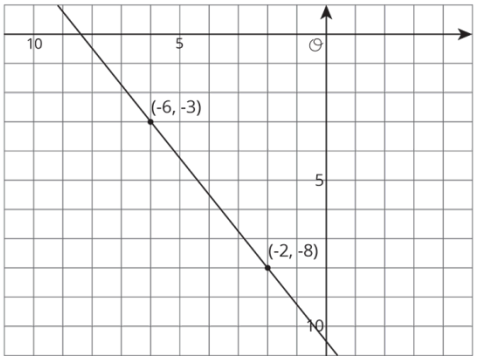


C



13. Suppose you wanted to graph the equation $y = -4x - 1$.

a) Describe the steps you would take to draw the graph.

b) How would you check that the graph you drew is correct?

14. Select **all** of the ordered pairs *(x,y)* that are solutions to the linear equation $2x + 3y = 6$.

A. $(0, 2)$

B. $(0, 6)$

C. $(2, 3)$

D. $(3, -2)$

E. $(3, 0)$

F. $(6, -2)$

15. For each equation, find y when $x = -3$. Then find x when $y = 2$

a) $y = 6x + 8$

b) $y = \frac{2}{3}x$

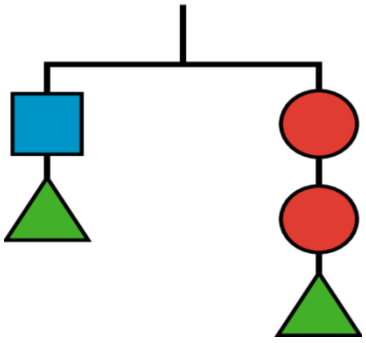
c) $y = -x + 5$

16. Here is a linear equation: $y = \frac{1}{4}x + \frac{5}{4}$

a) Are $(1, 1.5)$ and $(12, 4)$ solutions to the equation? Explain or show your reasoning.

b) Find the x-intercept of the graph of the equation. Explain or show your reasoning.

17. Which of the changes would keep the hanger in balance? Select **all** that apply.



A. Adding two circles on the left and a square on the right

B. Adding 2 triangles to each side

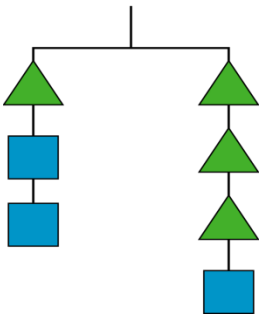
C. Adding two circles on the right and a square on the left

D. Adding a circle on the left and a square on the right

E. Adding a triangle on the left and a square on the right

18. What is the weight of a square if a triangle weighs 4 grams?

Explain your reasoning.



19. Andre solved an equation, but when he checked his answer he saw his solution was incorrect. He knows he made a mistake, but he can't find it. Where is Andre's mistake and what is the solution to the equation?

$$\begin{aligned} -2(3x-5) &= 4(x+3)+8 \\ -6x+10 &= 4x+12+8 \\ -6x+10 &= 4x+20 \\ 10 &= -2x+20 \\ -10 &= -2x \\ 5 &= x \end{aligned}$$

20. Solve each of these equations. Explain or show your reasoning.

a) $2(x + 5) = 3x + 1$ b) $3y - 4 = 6 - 2y$ c) $3(n + 2) = 9(6 - n)$

21. Elena said the equation $9x + 15 = 3x + 15$ has no solutions because $9x$ is greater than $3x$. Do you agree with Elena? Explain your reasoning.

22. For each equation, decide if it is always true or never true.

a) $x - 13 = x + 1$

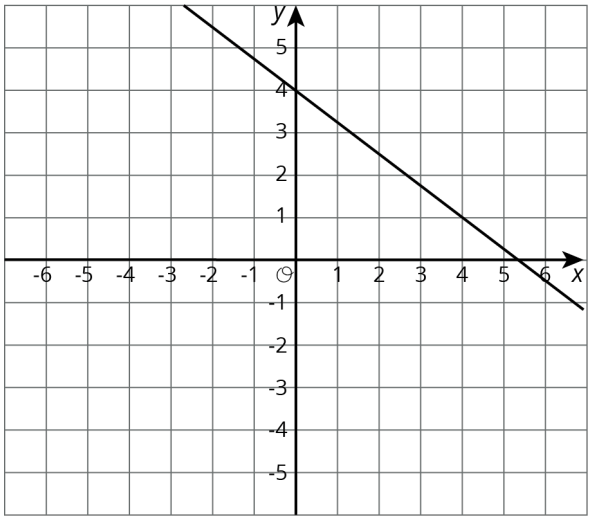
b) $2(x + 3) = 5x + 6 - 3x$

c) $3(x - 5) = 2(x - 5) + x$

23. Lin was looking at the equation 2x-32+4(3x-2462)=14x. She said, “I can tell right away there are no solutions, because on the left side, you will have 2x+12x and a bunch of constants, but you have just 14x on the right side.” Do you agree with Lin? Explain your reasoning.

24. For what value of x do the expressions $\frac{2}{3}x + 2$ and $\frac{4}{3}x - 6$ have the same value?

25. Here is the graph for one equation in a system of equations:



a) Write a second equation for the system so it has infinitely many solutions.

b) Write a second equation whose graph goes through (0, 1) so the system has no solutions.