

8th Grade Math
Spring Break Homework

Problems 1-16: Complete any 10

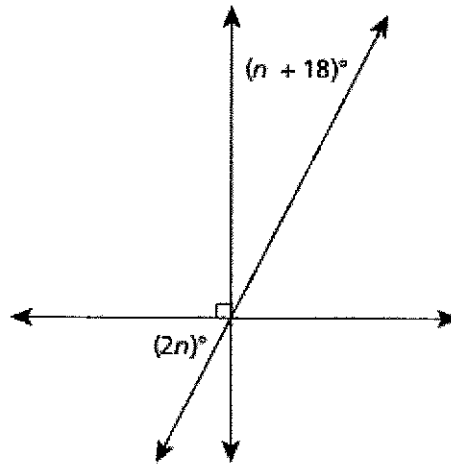
Problems 17 - 22: Complete any 3

Do more for extra credit.

Show All Work

- 1 The speed of light in a vacuum is 299,792,458 meters per second. Which number, written in scientific notation, is the **best** approximation of the speed of light?
- A 0.3×10^7 meters per second
 - B 0.3×10^8 meters per second
 - C 3.0×10^7 meters per second
 - D 3.0×10^8 meters per second
- 2 Which equation does **not** represent a linear function?
- A $y = 2(x - 3)$
 - B $y = 2^2 - 3x$
 - C $y = \frac{x + 1}{5}$
 - D $y = 2x^2 + 3x$

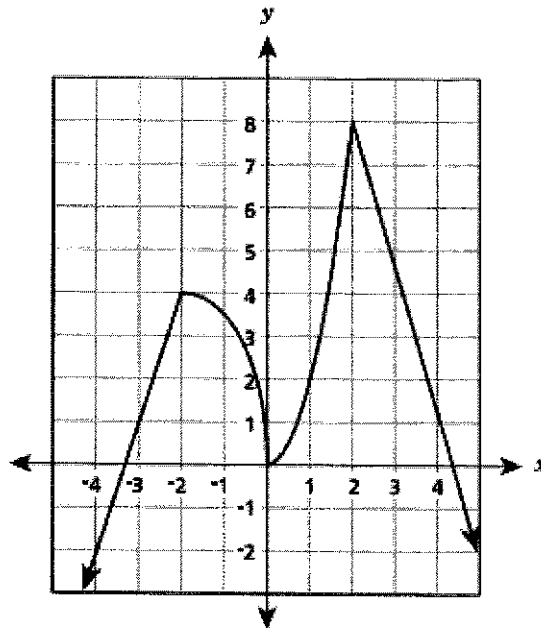
- 3 What is the value of n in the diagram below?



[not drawn to scale]

- A 18
- B 24
- C 42
- D 48

- 4 The graph of a function is shown below.



For which interval of x is the function decreasing and nonlinear?

- A between -4 and -2
- B between -2 and 0
- C between 0 and 2
- D between 2 and 4

5

Jenny wants to rent a truck for one day. She contacted two companies. Laguna's Truck Rentals charges \$20 plus \$2 per mile. Salvatori's Truck Rentals charges \$3 per mile. After how many miles will the total cost for both companies be the same?

- A 4
- B 6
- C 20
- D 60

6

The cost to rent a paddleboat at the city park includes an initial fee of \$7.00, plus \$3.50 per hour. Which equation models the relationship between the total cost, y , and the number of hours, x , that the paddleboat is rented?

A $y = 3.5x + 7$

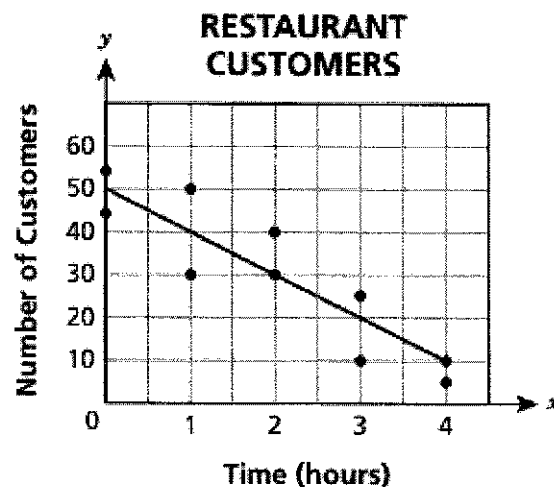
B $y = 7x + 3.5$

C $y = \frac{x}{7} + 3.5$

D $y = \frac{x}{3.5} + 7$

7

The scatter plot below shows the numbers of customers in a restaurant for four hours of the dinner service on two different Saturday nights. The line shown models this relationship, and $x = 0$ represents 7 p.m.



What does the value of the y -intercept represent?

A the average number of customers at 7 p.m.

B the average number of customers at 11 p.m.

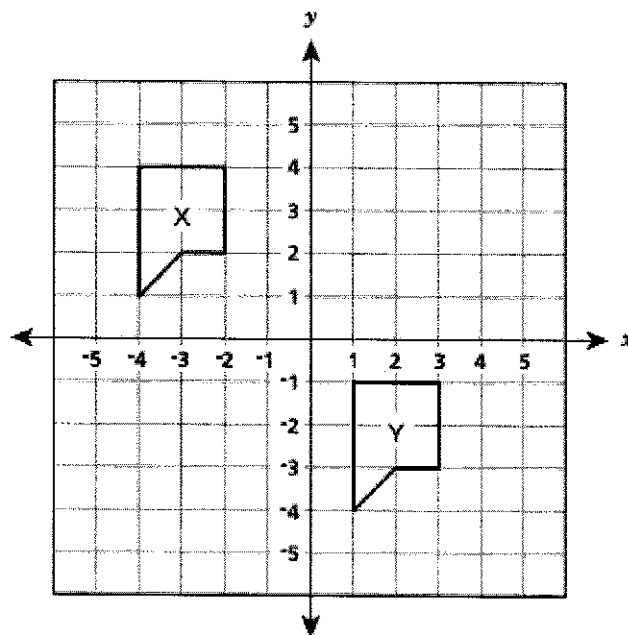
C the average change in the number of customers each hour

D the average change in the number of customers during four hours of the dinner service

8 Triangle M is similar to triangle N. Triangle M has two angles with measures of 32° and 93° . Which two angle measures could be included in triangle N?

- A 32° and 58°
- B 32° and 74°
- C 93° and 55°
- D 93° and 87°

9 Figure X and figure Y are shown on the coordinate grid below.



Which statement about figures X and Y must be true?

- A A series of translations will transform figure X to figure Y, and the figures will be congruent.
- B A 180° clockwise rotation will transform figure X to figure Y, and the figures will be congruent.
- C A series of translations will transform figure X to figure Y, but the figures will not be congruent.
- D A 180° clockwise rotation will transform figure X to figure Y, but the figures will not be congruent.

10 Which exponential expression is equal to $2^{-5} \cdot 2^8$?

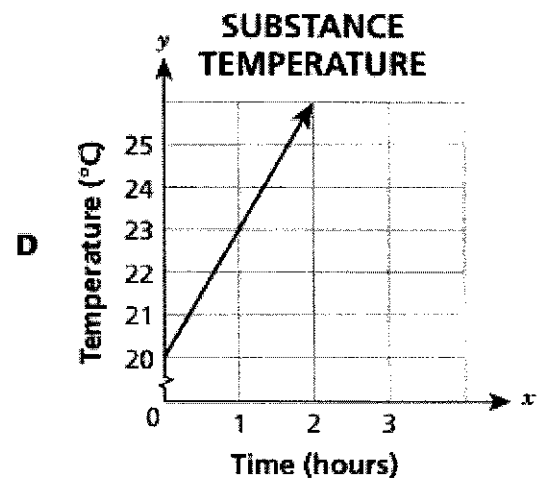
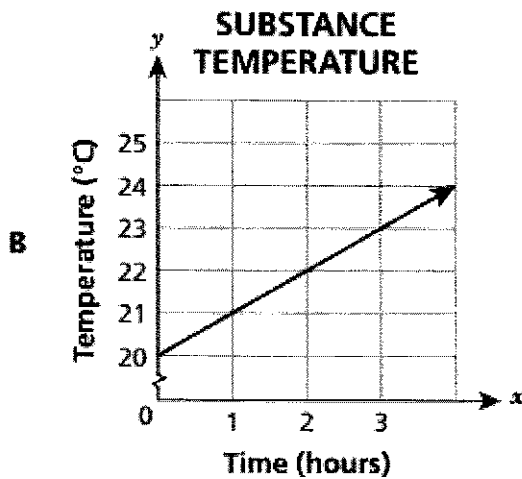
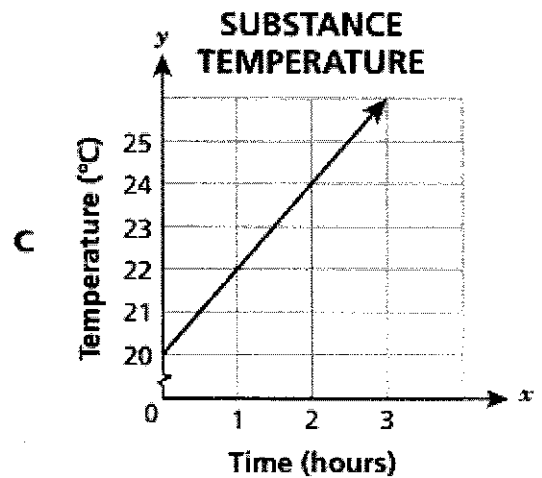
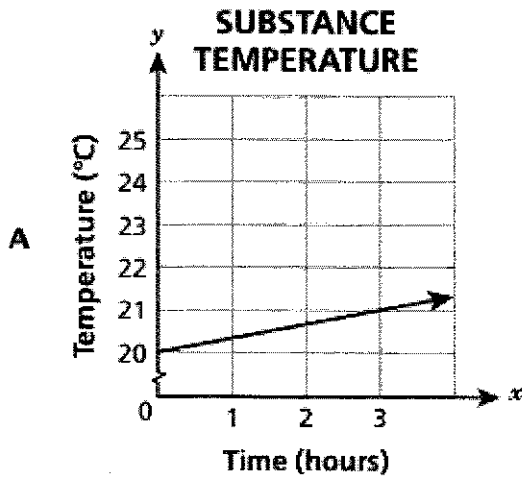
A $\frac{2^2}{2^{-1}}$

B $(2^3)^{-1}$

C $\frac{2^{-2}}{2^{-1}}$

D $(2^{-1})^3$

11 During an experiment, the temperature of a substance increased at a constant rate of three degrees Celsius ($^{\circ}\text{C}$) per hour. Which graph represents this relationship?



12

A line contains the points $(4, 2)$ and $(0, -1)$. What is the equation of the line?

A $y = 2x - 6$

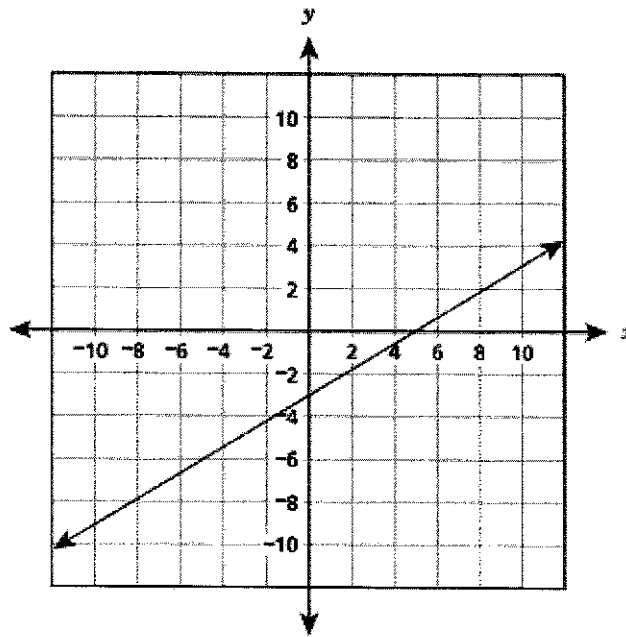
B $y = \frac{3}{4}x - 1$

C $y = \frac{1}{4}x + 1$

D $y = \frac{4}{3}x - \frac{10}{3}$

13

Function 1 is defined by the equation $y = \frac{3}{4}x + 1$, and function 2 is represented by the graph below.



Which statement about the functions is true?

A Function 1 has the greater rate of change and the greater y-intercept.

B Function 2 has the greater rate of change and the greater y-intercept.

C Function 1 has the greater rate of change, and function 2 has the greater y-intercept.

D Function 2 has the greater rate of change, and function 1 has the greater y-intercept.

14

What is the equation of the line that passes through point $(4, 12)$ and has a y -intercept of -2 ?

A $y = \frac{5}{2}x - 2$

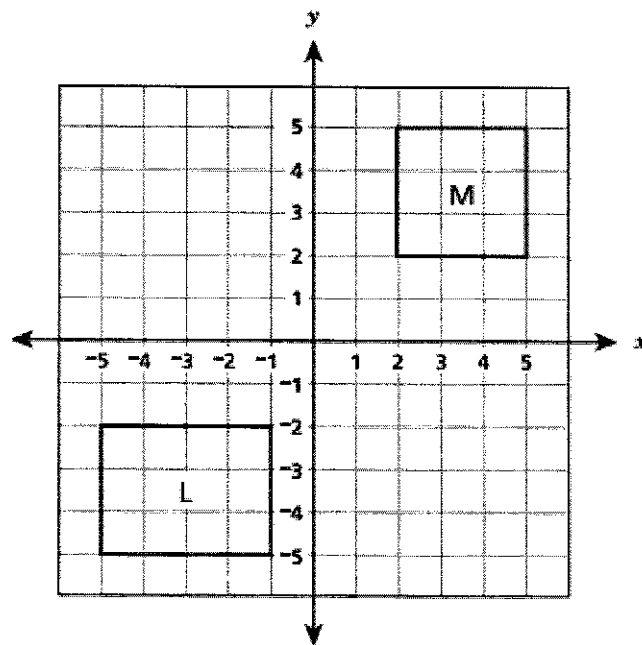
B $y = \frac{7}{2}x - 2$

C $y = 2x - 2$

D $y = 6x - 2$

15

Figure L and figure M are shown on the grid below.



Maria wants to transform figure L to figure M using only rotations, reflections, and translations. Which statement is true?

- A** The transformation can be done with a reflection followed by a rotation.
- B** The transformation can be done with a reflection followed by a translation.
- C** The transformation cannot be done because figure L is not congruent to figure M.
- D** The transformation cannot be done because figures L and M are in different quadrants.

16

The winning time for the men's 400-meter race in each of the Olympic Games from 1976 to 1996 can be modeled by the equation $y = -0.054x + 44.54$, where x is the number of years after 1976 and y is the winning time in seconds. If the relationship continues, which equation could be used to predict the winning time in the year 2020?

A $y = -0.054(1976) + 44.54$

B $y = -0.054(2020) + 44.54$

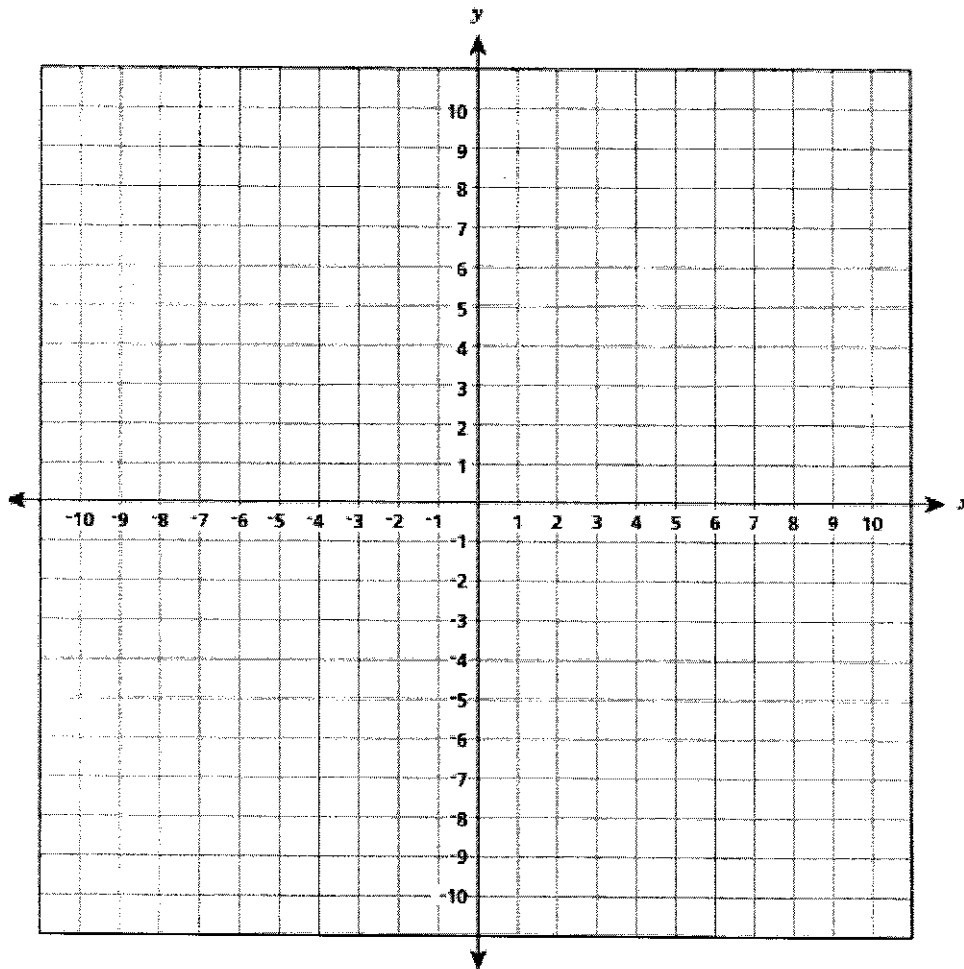
C $y = -0.054(24) + 44.54$

D $y = -0.054(44) + 44.54$

17

A certain function is defined as "multiply the input by $-\frac{3}{4}$, then add 2."

Graph the function on the coordinate plane below.



18

The table below shows a relation between x and y .

x	y
-4	16
-2	4
0	0
2	4
4	16
6	36

Susie said the relation above is also a function. Explain why Susie is correct or incorrect.

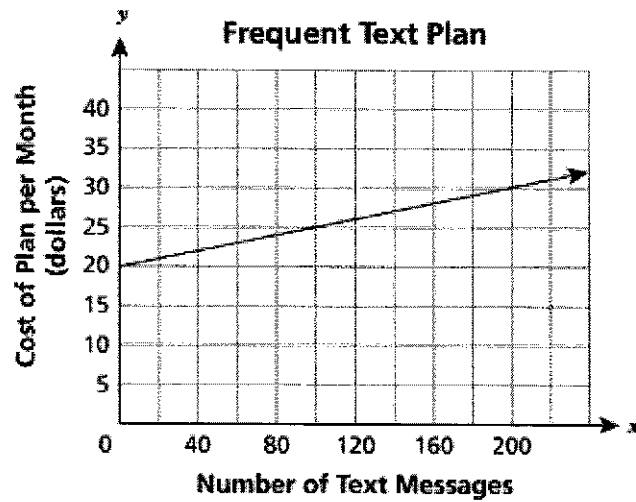
19

A customer is comparing two different text message plans at Cellular Bargains. He wants to find out which plan allows the most text messages for the same cost.

The Pay Per Text Plan charges \$10 per month and \$0.10 for each text message. Write a function that models this plan, stating what your variables represent.

Answer _____

The Frequent Text Plan is modeled by the graph shown below.



How many text messages would result in the same cost per month for the two plans?

Show your work.

20

Quadrilateral $ABCD$ is graphed on a coordinate plane.

- Abby reflected $ABCD$ over the x -axis and then rotated it 90° clockwise about the origin. She labeled the final image $EFGH$.
- Manny dilated $ABCD$ by a scale factor of 3 and then translated the resulting figure 2 units left. He labeled the final image $PQRS$.

Identify a pair of quadrilaterals from the three quadrilaterals $ABCD$, $EFGH$, and $PQRS$ that are congruent.

Answer _____

Identify a pair of quadrilaterals from the three quadrilaterals $ABCD$, $EFGH$, and $PQRS$ that are similar but not congruent.

Answer _____

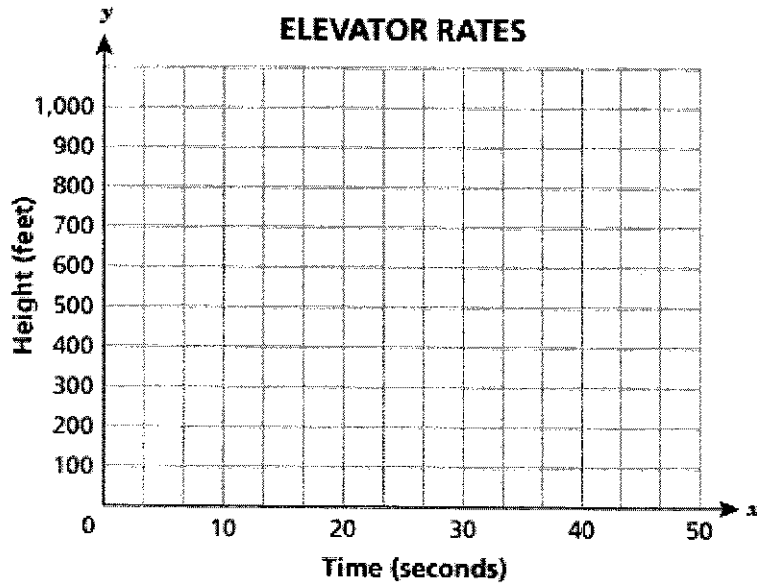
Describe a transformation on Abby's quadrilateral $EFGH$ that would make the resulting image $E'F'G'H'$ congruent to Manny's quadrilateral $PQRS$.

21

The express elevator in the Empire State Building in New York City travels nonstop from the ground floor to the top floor at a rate of 1,400 feet per minute.

The express elevator in the John Hancock Center in Chicago travels nonstop from the ground floor to the observatory on the top floor at a rate represented by the equation $y = 30x$, where y is the height, in feet, and x is the number of seconds.

Graph the two relationships on the grid below to compare the rates of the two elevators.



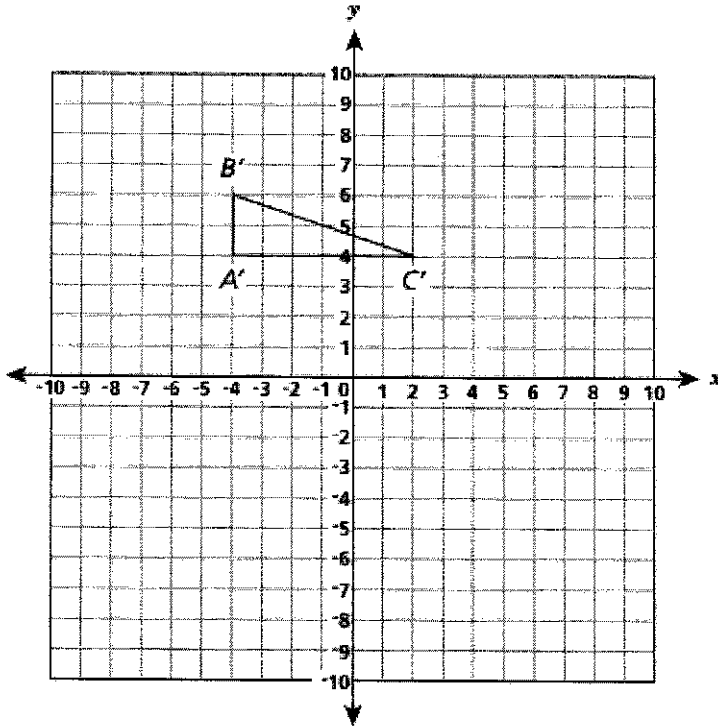
Which elevator travels at a faster rate?

Using the information from the graph, explain how you got your answer.

Answer

22

When $\triangle ABC$ was dilated by a scale factor of 2, centered at the origin, the result was its image $\triangle A'B'C'$ shown on the coordinate plane below. The vertices of $\triangle A'B'C'$ are $A'(-4, 4)$, $B'(-4, 6)$, and $C'(2, 4)$.



What are the coordinates of the vertices of $\triangle ABC$?

Vertices A (____, ____) B (____, ____) C (____, ____)

Explain how you determined the coordinates of the vertices of $\triangle ABC$.
