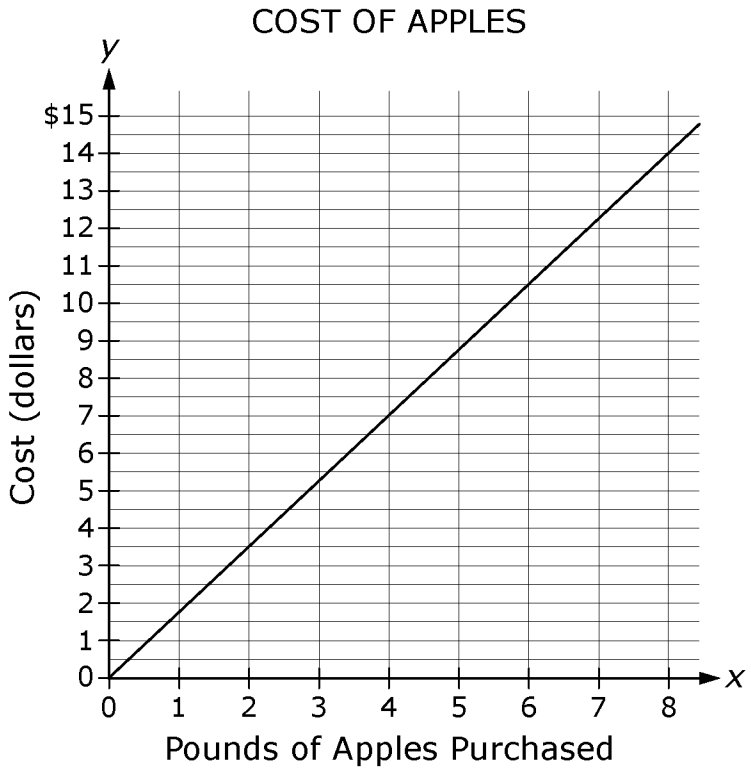
Name _____ Period _____ Date _____

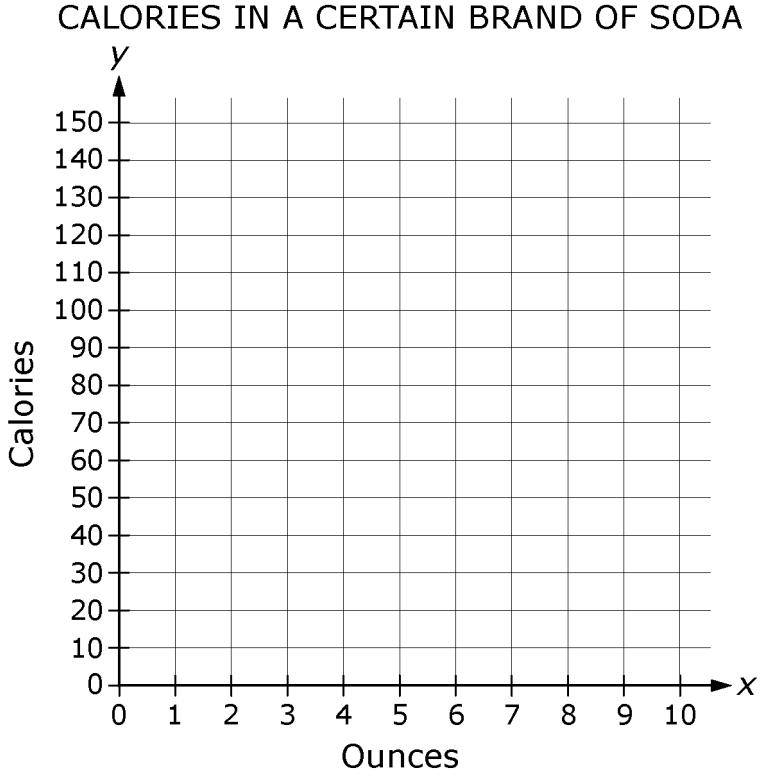
Grade 8 Unit 4 Model Curriculum Assessment

1. The graph below shows the relationship between the number of pounds of apples purchased and the cost of the purchase at an apple orchard. What is the cost per pound of apples at the orchard?



2. There are 60 calories in 5 ounces of a certain brand of soda.

Part A: Represent the relationship between the number of calories and the number of ounces of soda as a line in the coordinate plane below.



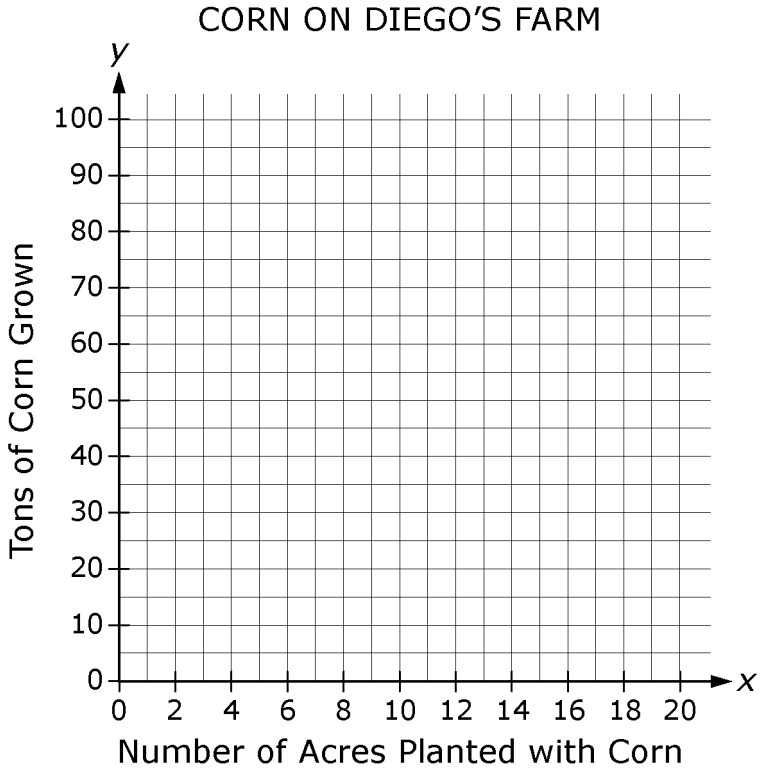
Part B: What is the number of calories per ounce of soda?

Part C: How does the unit rate relate to the slope of the line in the graph above? Explain your answer.

3. Diego is planting corn on his farm. He predicts that he will grow 20 tons of corn when he plants 5 acres with corn.

Part A: Use the information above to complete the table and then create a graph that represents the number of tons of corn grown for different numbers of acres planted.

Number of Acres Planted with Corn	Tons of Corn Grown
5	20
10	
15	
20	



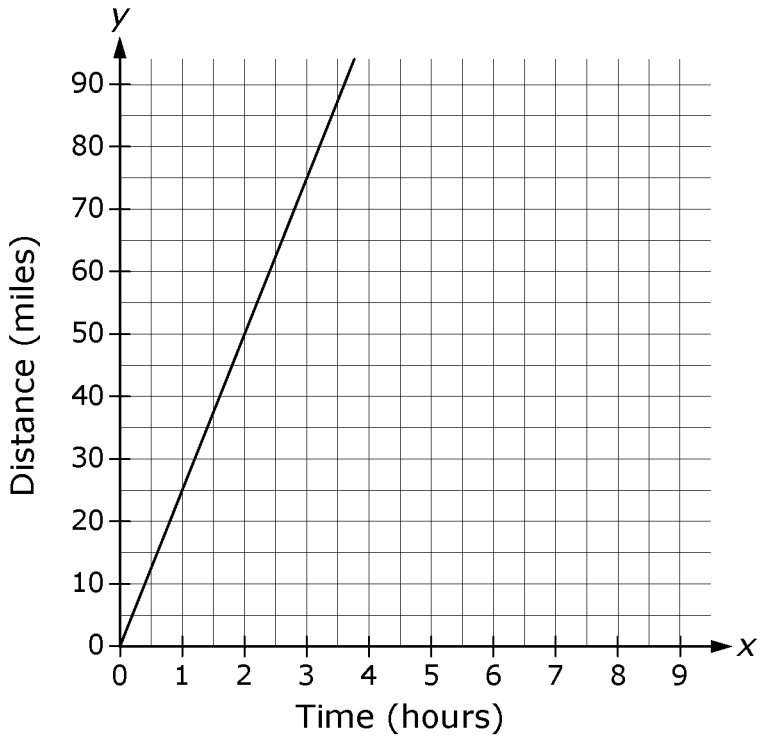
Part B: Based on his prediction, how many tons of corn will Diego grow per acre planted with corn?

4. Train *A* and train *B* are traveling on separate tracks. The distance, *y*, in miles, that each train travels in *x* hours is represented below, where train *A*'s distance is represented with an equation and train *B*'s distance is represented with a graph.

TRAIN *A*

$y = 35x$

TRAIN *B*



Which train is traveling faster? Explain your answer.

5. Water flows into two different tanks of the same size. The amount of water, y, in ounces, that flows into each tank in x minutes is represented below.

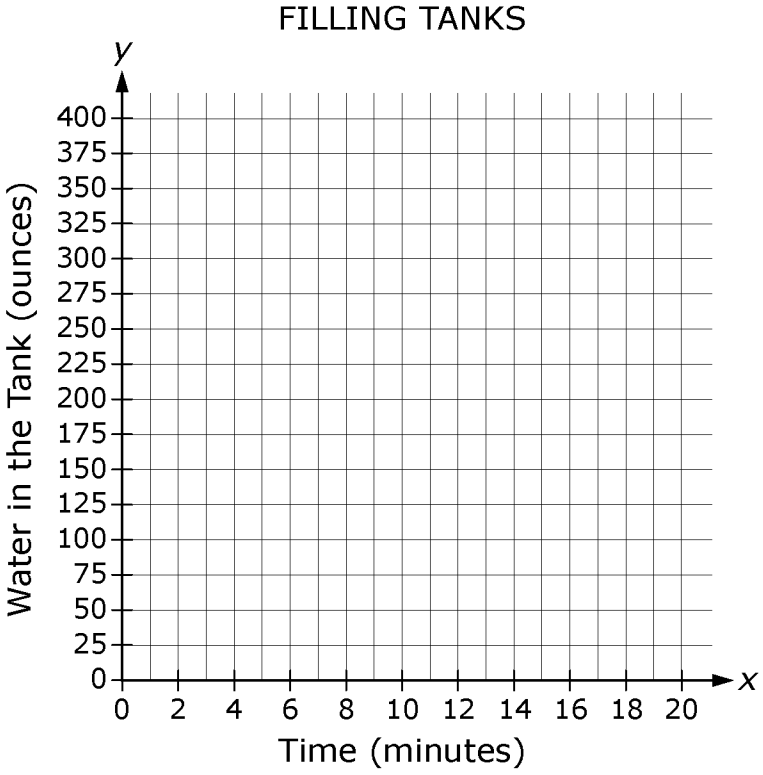
Tank *A*

$y = 25x$

Tank *B*

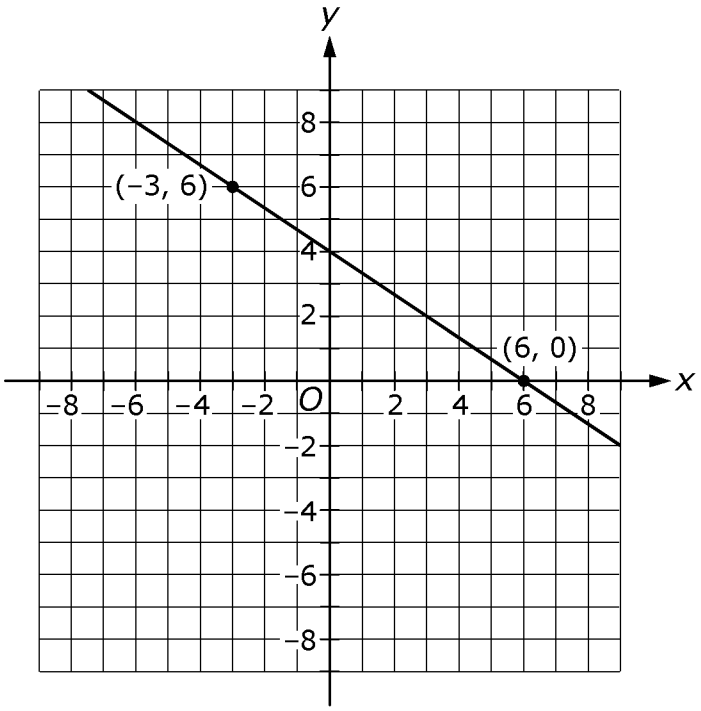
x	y
5	75
10	150
15	225
20	300

Part A: On the coordinate plane below, use lines to represent the amount of water in tank *A* and tank *B* as they are filled with water. Label each line with the tank it describes.



Part B: Which tank is filling at a faster rate? Explain your answer.

6. Which of the following is an equation of the line whose graph is shown in the coordinate plane below?



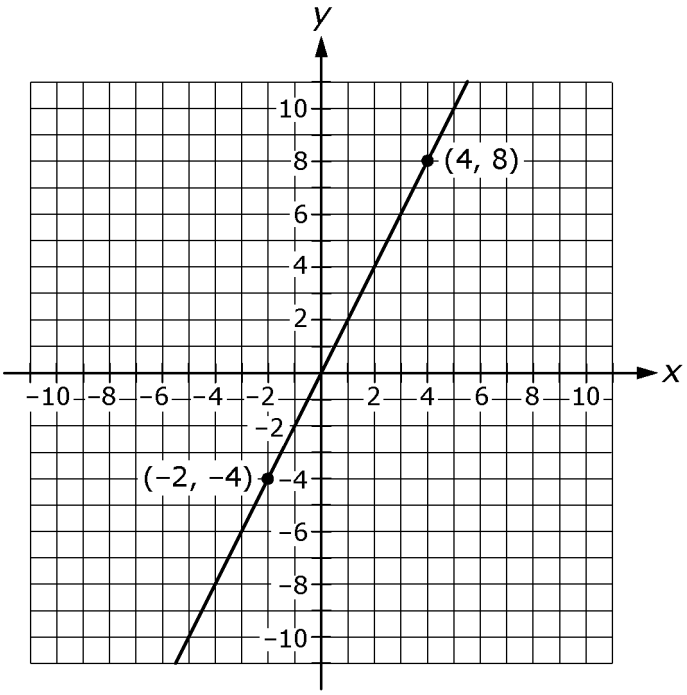
a. $y = -\frac{3}{2}x + 4$

b. $y = -\frac{2}{3}x + 4$

c. $y = \frac{2}{3}x + 6$

d. $y = \frac{3}{2}x + 6$

7. Write an equation that represents the graph of the line shown in the coordinate plane below.



8. Which of the following is an equation of the line whose graph in the coordinate plane passes through the points $(-2, 0)$ and $(3, 1)$?

a. $y = 5x$

b. $y = 5x - 2$

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

d. $y = \frac{1}{5}x + \frac{2}{5}$

9. Which of the following is an equation of the line that has a slope of $\frac{1}{3}$ and passes through the point $(-6, 2)$?

a. $y = \frac{1}{3}x$

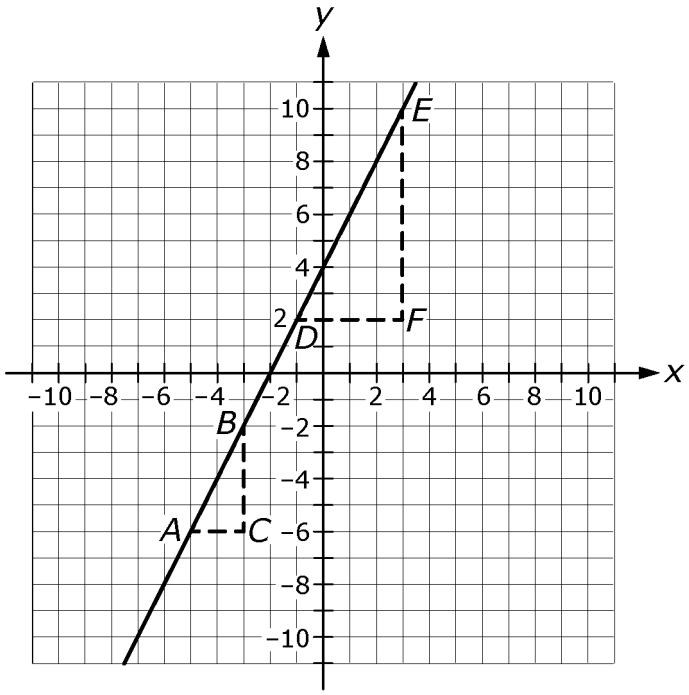
b. $y = \frac{1}{3}x - 4$

c. $y = \frac{1}{3}x + 4$

d. $y = \frac{1}{3}x + \frac{20}{3}$

10. The graph of a line has an x-intercept of -3 and a y-intercept of -5. Write an equation of the line in the form $y = mx + b$. Show your work.

11. Which of the following statements **best** explains why triangles *ABC* and *DEF* can be used to show that the slope of the segment between points *A* and *B* is the same as the slope of the segment between points *D* and *E* in the graph below?



a. The length of segment *DE* is twice as long as the length of segment *AB*.

b. Segment *AB* and segment *DE* are hypotenuses of right triangles.

c. Triangles *ABC* and *DEF* are congruent.

d. Triangles *ABC* and *DEF* are similar.

12. Solve the equation $-\frac{2}{3}(4x-5)=6$ for x. Show your work.

13. Indicate if each equation in the table below has no solutions, one solution, or infinitely many solutions by checking the appropriate box in each row.

	No Solutions	One Solution	Infinitely Many Solutions
$\frac{1}{3}(18-6x)=8-2x$			
$x+16=16+2x-3x$			
$11+6x-14=\frac{3}{5}(15x-5)$			
$-(x-1)=1-x$			

14. What value for x makes the equation below true? Show your work.

$$2(x + 0.6) + 5(1.02 - x) = 0$$

15. What is the solution of the equation $-14 + 2x + 3 = 4x - 13 - 7x$?

a. $x = -\frac{9}{16}$

b. $x = -\frac{2}{5}$

c. $x = \frac{2}{5}$

d. $x = \frac{9}{16}$

16. Which of the following is true for the equation $5 - 3(2x - 7) = 2(7 - 3x)$?

a. $x = 0$

b. $x = 28$

c. The equation has no solution.

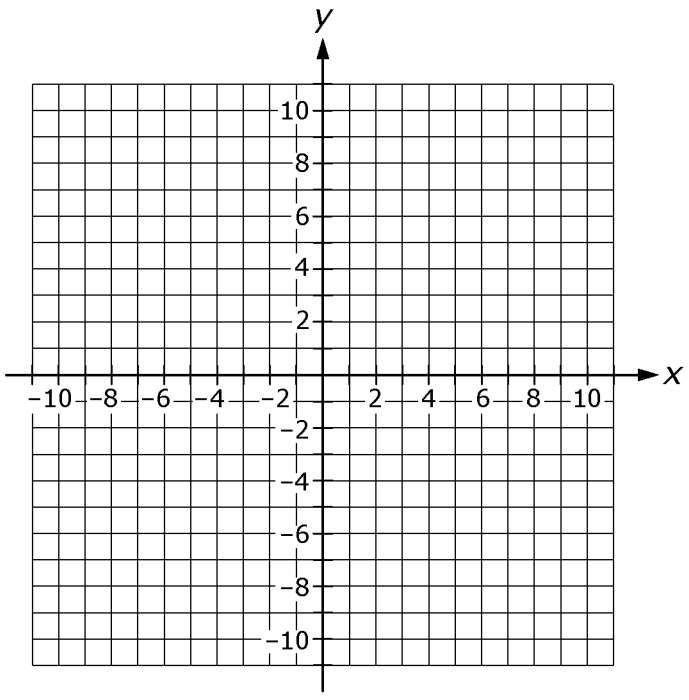
d. The equation has infinitely many solutions.

17. Determine the solution to the following system of equations. Show your work.

$$3x + 4y = 16$$
$$-3x + 2y = -10$$

18. Graph the following system of equations on the coordinate plane below. Write the solution to the system in the blank provided.

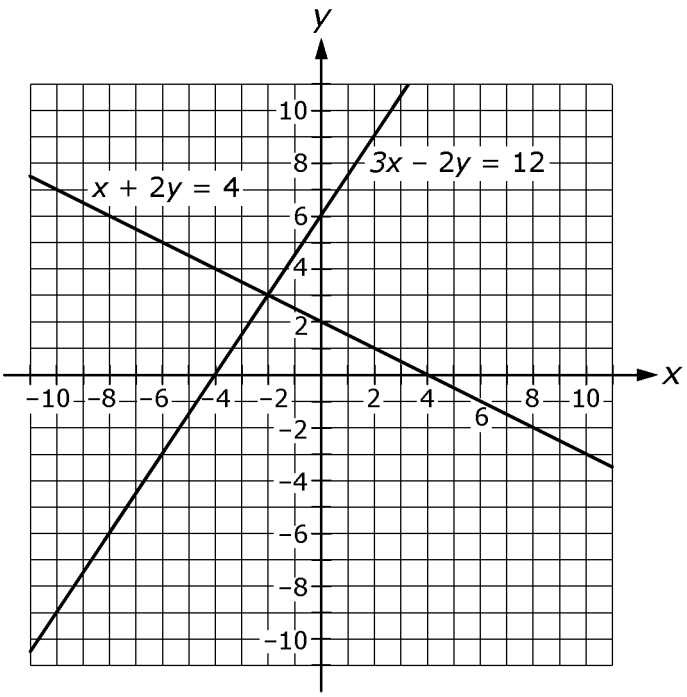
$$2x + 3y = 6$$
$$x - 2y = 10$$



Solution: _____

19. The graphs of the equations in the system below are shown in the coordinate plane.

$$x + 2y = 4$$
$$3x - 2y = -12$$



Based on the graph provided, what is the solution to the system of equations?

20. In the coordinate plane, which of the following is true about the graph of the system of equations below?

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

a. The intersection point is $(-5, 1)$.

b. The intersection point is $(5, 1)$.

c. There are no points of intersection.

d. There are infinitely many points of intersection.

21. Is $(-3, 11)$ a solution to the system of equations shown below? Explain your answer.

$$x - 3y = -36$$
$$3x + 4y = 48$$

22. Wayne joins a health club and keeps track of his total club expenses at the end of each month of his membership, as shown in the table. The total expenses consist of a one-time registration fee and a cost per month.

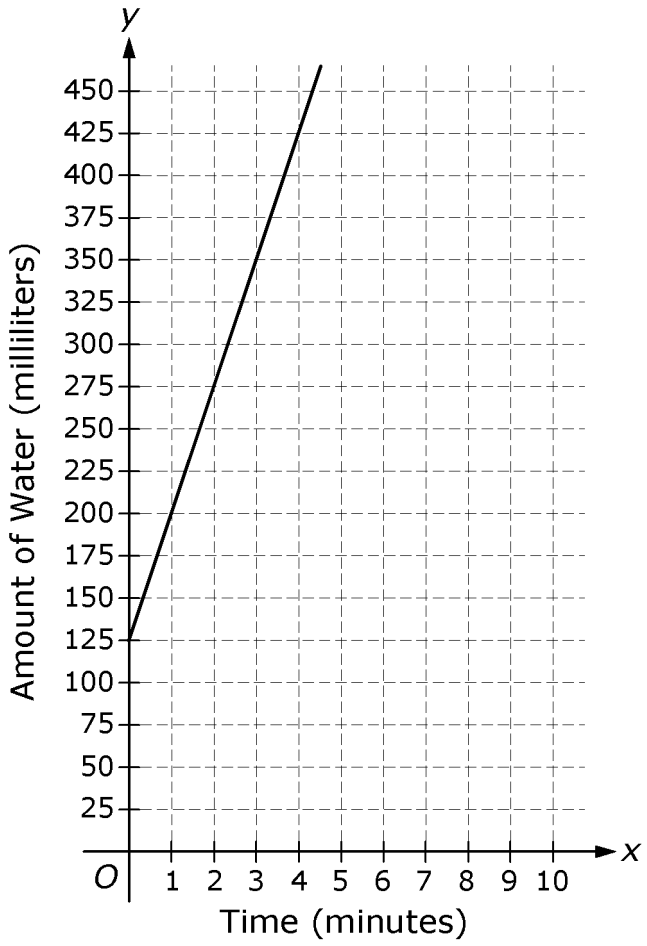
Month, x	Cumulative Health Club Expenses, y
1	$ 85
2	$110
3	$135
4	$160
5	$185

Part A: What is the one-time registration fee?

Part B: How much does Wayne pay each month to be a member of the health club?

Part C: Write a function that shows the relationship between Wayne's cumulative health club expenses, y, and the number of months since he joined the health club, x.

23. A bucket contains an amount of water before a water faucet is turned on at time $x = 0$. Water flows into the bucket at a constant rate while the faucet is on. The graph below shows the amount of water, y, in the bucket each minute after the faucet is turned on. Which of the following functions represents the amount of water in the bucket, y, in terms of the number of minutes, x, since the faucet was turned on?



a. $y = 75x + 125$
b. $y = 125x + 75$
c. $y = 125x + 200$
d. $y = 200x + 125$

24. Natalie borrowed money from her parents to pay for a trip. Natalie will pay her parents in equal amounts every week until she pays back the entire amount she borrowed. The table below shows the amount of money Natalie still owes her parents at the end of every two weeks for the first eight weeks.

Number of Weeks Natalie Has Paid, *w*	Amount Natalie Still Owes, *d*
0	$180
2	$162
4	$144
6	$126
8	$108

Part A: How much does Natalie pay her parents each week?

Part B: Write a function that shows the relationship between the amount Natalie still owes, *d*, and the number of weeks she has paid, *w*.

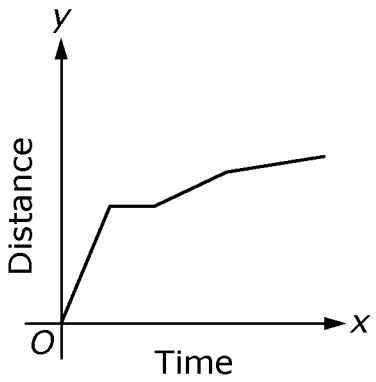
25. The total profit a company earns from selling cups of tea increases at a constant rate and is shown in the table below.

Cups of Tea, t	Total Profit, p
20	$14.00
30	$21.00
45	$31.50
65	$45.50

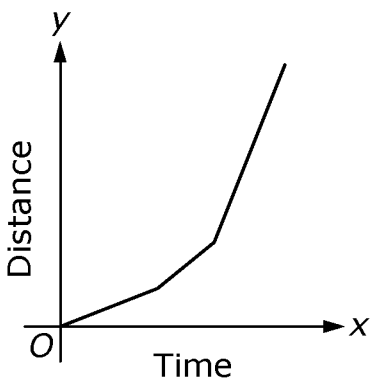
Write a function for the total profit, p, in dollars, in terms of the number of cups of tea, t.

26. Jessica takes a road trip. She begins by driving slowly at a constant speed for a short distance and then stopping at a stop sign. After the short stop she drives again at a faster constant speed than before, and then she enters the highway after a short distance. Once on the highway, she drives at an even faster constant speed. Which of the following graphs best illustrates the part of Jessica's road trip described?

a.



b.



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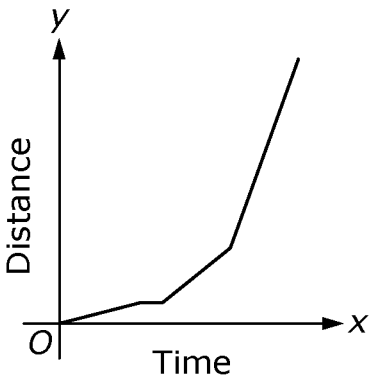

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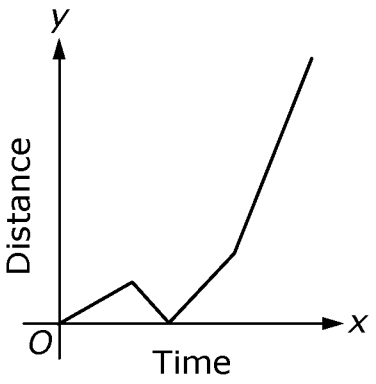
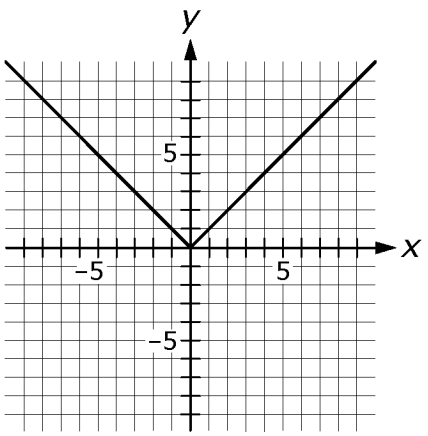
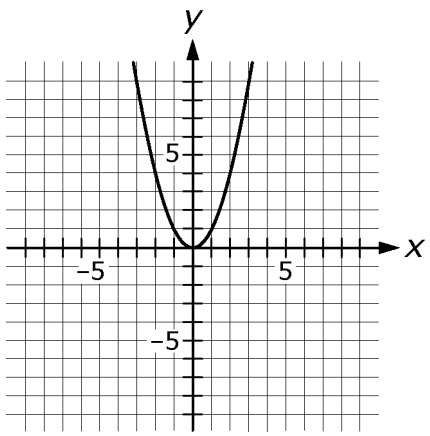


27. Which of the following graphs shows a function where the values of y decrease as the values of x increase over the entire portion of the graph shown?

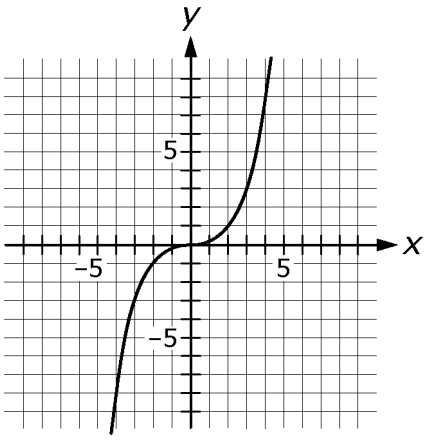
a.



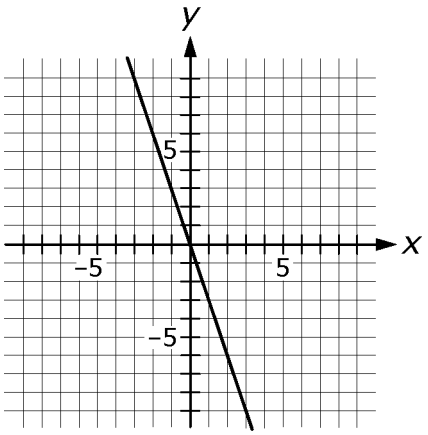
b.



c.



d.



28. At a buffet restaurant, the cost for a meal is $10.00 for up to 20 ounces of food. Any amount of food greater than 20 ounces is charged at a rate of $0.50 per ounce. Graph the relationship between the amount of food, in ounces, and the cost of the meal, in dollars, on the coordinate plane below.