

## Common Core Math I: Unit 4 Test

### Multiple Choice

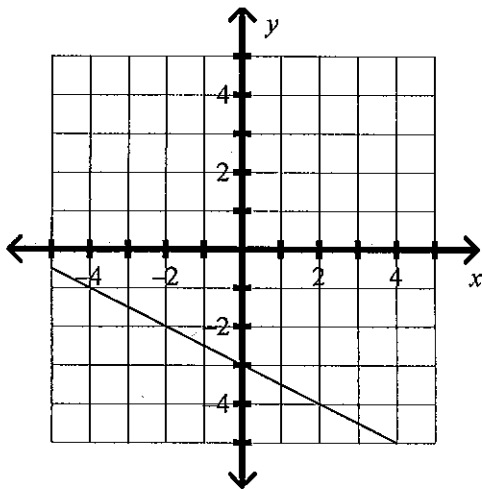
Identify the choice that best completes the statement or answers the question.

**In the following situations, is there likely to be a correlation? If so does the correlation reflect a causal relationship? Explain.**

- \_\_\_\_\_ 1. the average daily winter temperature and your heating bill
- There is a positive correlation. The higher the average daily winter temperature the higher your heating bill.
  - There is a negative correlation and a causal correlation. The higher the average daily winter temperature the lower your heating bill.
  - There is no correlation.
- \_\_\_\_\_ 2. the number of hours spent studying for a test and your test mark
- There is a positive correlation and also a causal relationship. The more you study for a test the better your mark is likely to be.
  - There is a negative correlation. The more you study for a test, the worse your mark is likely to be.
  - There is no correlation.

**Find the slope of the line.**

\_\_\_\_\_ 3.

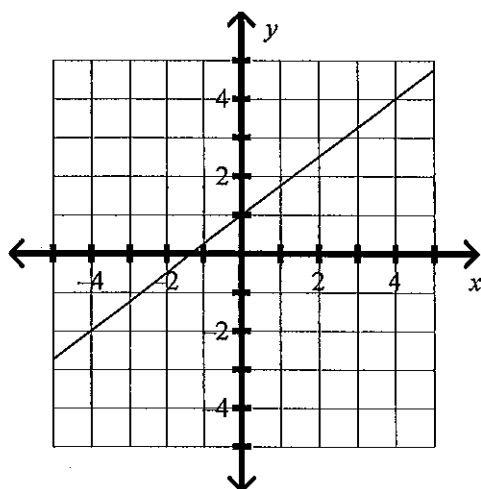


- a.  $\frac{1}{2}$       b.  $-\frac{1}{2}$       c.  $-2$       d.  $2$

Name: \_\_\_\_\_

ID: A

\_\_\_\_\_ 4.



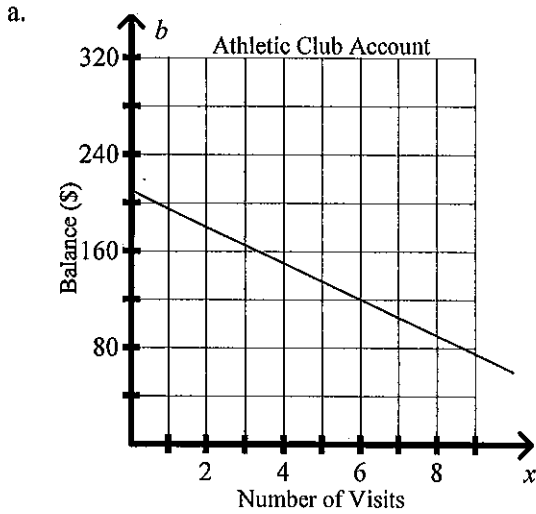
a.  $\frac{3}{4}$

b.  $-\frac{4}{3}$

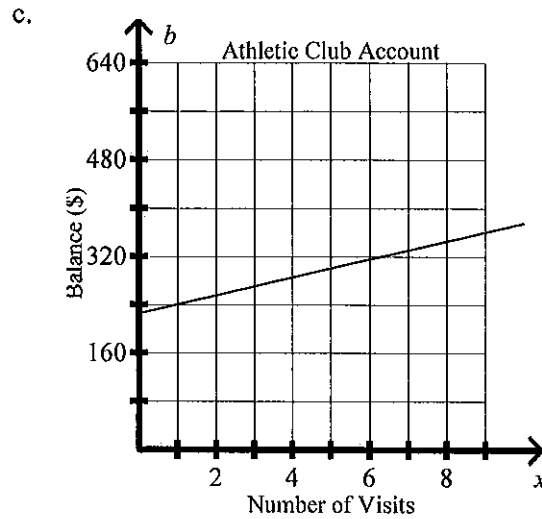
c.  $-\frac{3}{4}$

d.  $\frac{4}{3}$

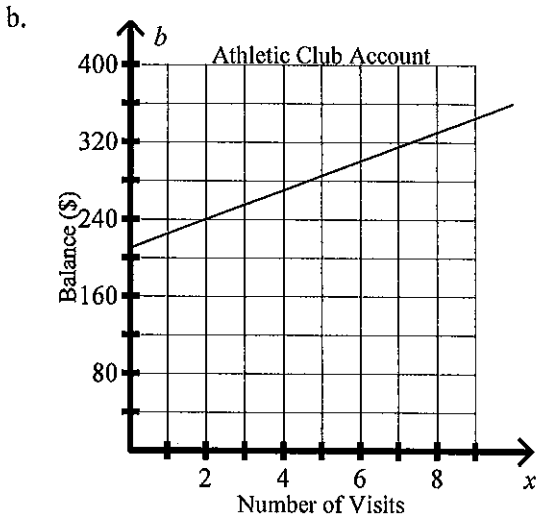
5. Giselle pays \$210 in advance on her account at the athletic club. Each time she uses the club, \$15 is deducted from the account. Model the situation with a linear function and a graph.



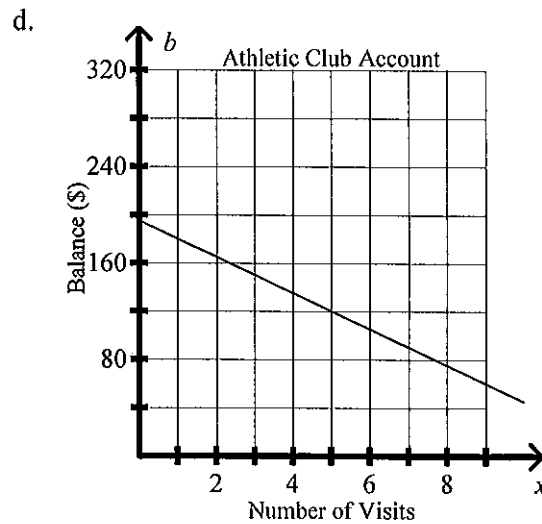
$$b = 210 - 15x$$



$$b = 195 + 15x$$



$$b = 210 + 15x$$



$$b = 195 - 15x$$

- 6.

Practice (hours)	1	2	3	4	5	6
Typing Speed (words per minute)	21	26	35	37	40	?

- a.  $y = 5.1x + 17$ ;  $r = 0.971$ ; about 47 words per minute  
 b.  $y = 17.1x + 4.9$ ;  $r = 0.791$ ; about 142 words per minute  
 c.  $y = 4.9x + 17.1$ ;  $r = 0.971$ ; about 47 words per minute  
 d.  $y = 4.6x + 16$ ;  $r = 0.902$ ; about 53 words per minute

Write an equation of a line with the given slope and  $y$ -intercept.

\_\_\_\_\_ 7.  $m = \frac{1}{4}, b = -\frac{3}{4}$

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

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

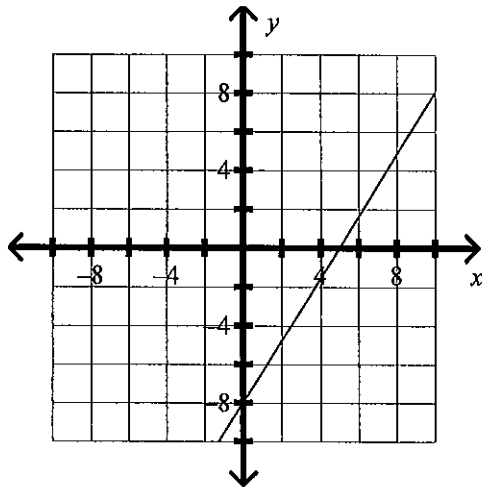
c.  $y = -\frac{3}{4}x + \frac{1}{4}$

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

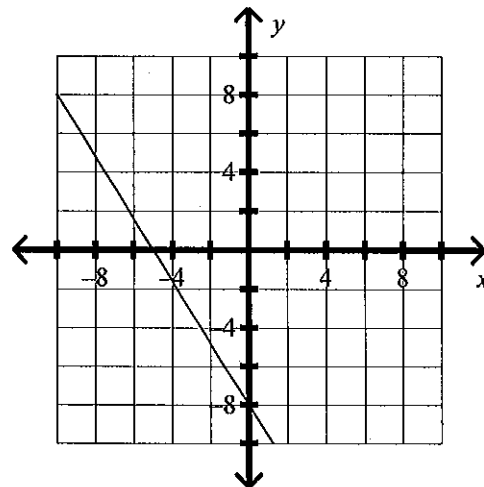
Match the equation with its graph.

\_\_\_\_\_ 8.  $-8x - 5y = 40$

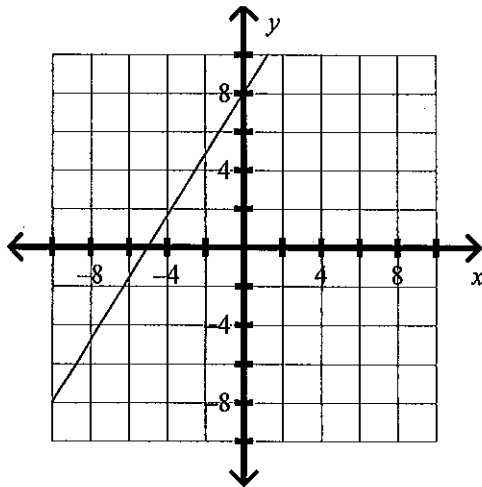
a.



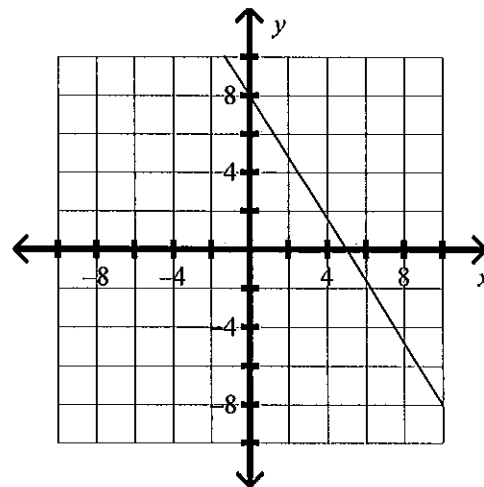
c.



b.

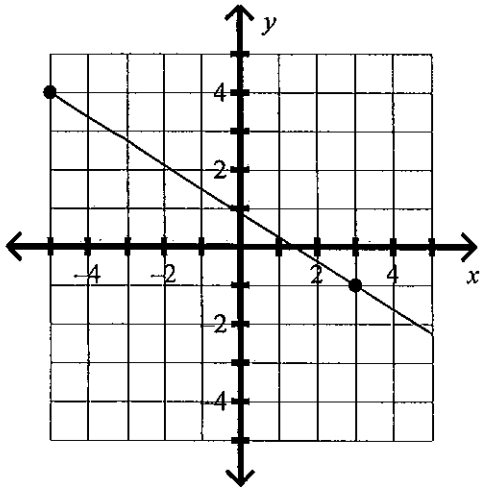


d.



Write the slope-intercept form of the equation for the line.

\_\_\_\_\_ 9.



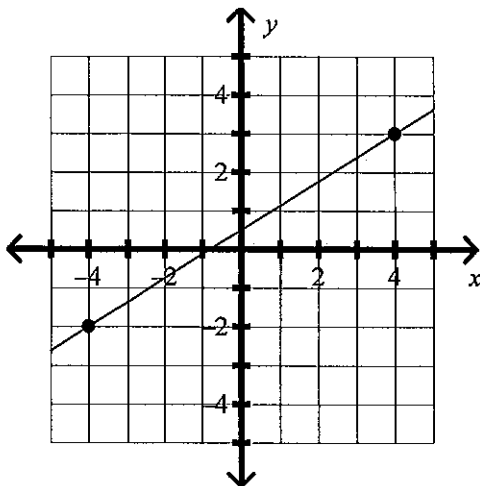
a.  $y = -\frac{5}{8}x + \frac{7}{8}$

b.  $y = \frac{5}{8}x + \frac{7}{8}$

c.  $y = \frac{7}{8}x + \frac{5}{8}$

d.  $y = -\frac{8}{5}x + \frac{7}{8}$

\_\_\_\_\_ 10.



a.  $y = -\frac{5}{8}x + \frac{1}{2}$

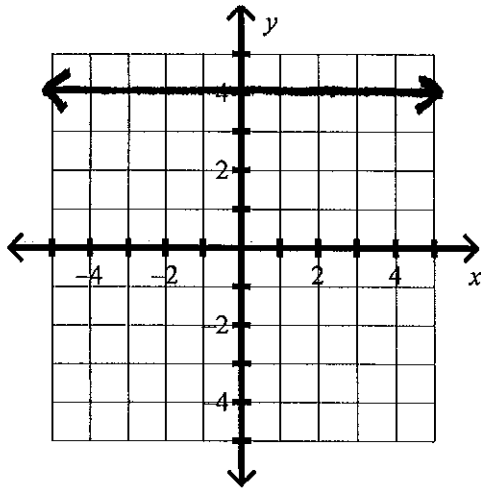
b.  $y = \frac{8}{5}x - \frac{1}{2}$

c.  $y = \frac{5}{8}x + \frac{1}{2}$

d.  $y = \frac{8}{5}x + \frac{1}{2}$

What is the slope of the line?

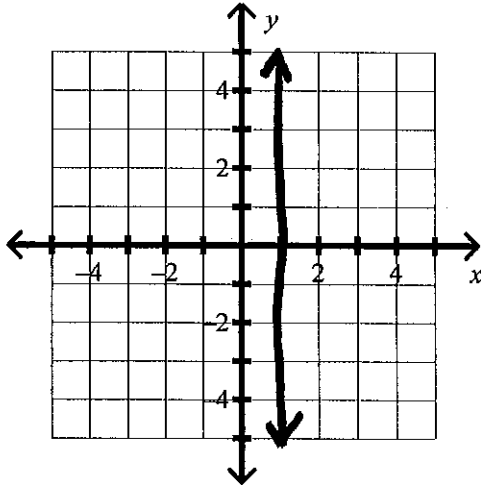
\_\_\_\_\_ 11.



a. undefined

b. 0

\_\_\_\_\_ 12.



a. 0

b. undefined

What is the slope of the line that passes through the pair of points?

\_\_\_\_\_ 13.  $(-\frac{5}{3}, -1), (-2, \frac{9}{2})$

a.  $\frac{2}{33}$

b.  $-\frac{2}{33}$

c.  $-\frac{33}{2}$

d.  $\frac{33}{2}$

\_\_\_\_\_ 14.  $(-5.5, 6.1), (-2.5, 3.1)$

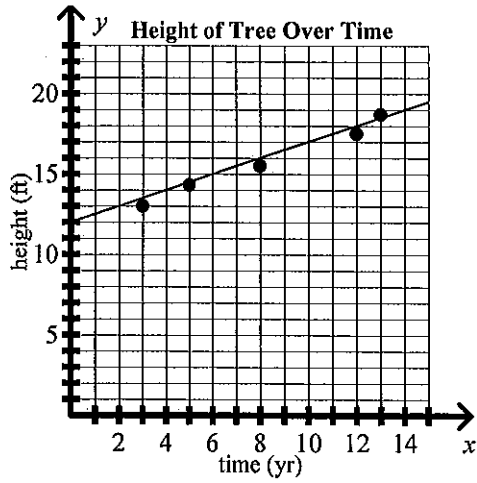
a. -1

b. 1

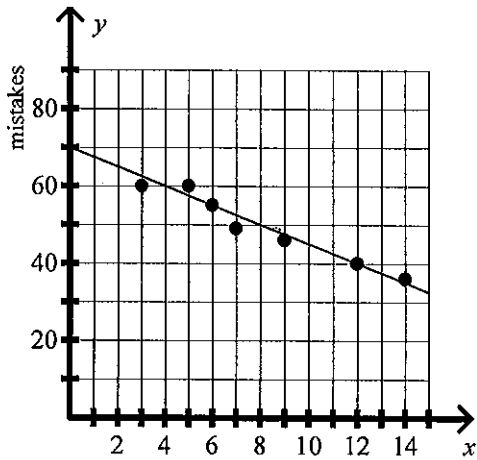
c. 

d. 

15. The scatter plot below shows the height of a tree over time. What is the approximate height of the tree after 10 years?



- a. 13 ft  
 b. 20 ft  
 c. 17 ft  
 d. 21 ft
16. The scatter plot shows the number of mistakes a piano student makes during a recital versus the amount of time the student practiced for the recital. How many mistakes do you expect the student to make at the recital after 13 hours of practicing?



- a. 72 mistakes  
 b. 49 mistakes  
 c. 28 mistakes  
 d. 38 mistakes

The rate of change is constant in each table. Find the rate of change. Explain what the rate of change means for the situation.

17. The table shows the cost of a ski rental package for a given number of people.

People	Cost (\$)
4	160
5	200
6	240
7	280

- a.  $\frac{1}{280}$  dollars per person; the cost is \$1 for 280 people.  
 b.  $\frac{160}{1}$  dollars per person; the cost is \$160 for each person.  
 c.  $\frac{1}{40}$  dollars per room; the cost is \$40 for each person.  
 d.  $\frac{40}{1}$  dollars per person; the cost is \$40 for each person.

Does the equation represent a direct variation? If so, find the constant of variation.

18.  $2x - 4y = 0$

- a. yes;  $k = -4$       b. no      c. yes;  $k = \frac{1}{2}$       d. yes;  $k = -\frac{1}{2}$

19.  $2x^2 + 4y = 0$

- a. no      b. yes;  $k = \frac{1}{2}$       c. yes;  $k = 2$       d. yes;  $k = -\frac{1}{2}$

What equation in slope intercept form represents the line that passes through the two points?

20.  $(6.9, 5.9), (10.9, -2.1)$

- a.  $y = 0.5x - 19.7$       c.  $y = -0.5x - 19.7$   
 b.  $y = 2x + 19.7$       d.  $y = -2x + 19.7$

21.  $(2, 5), (9, 2)$

- a.  $y = \frac{3}{7}x - \frac{41}{7}$       c.  $y = \frac{7}{3}x + \frac{41}{7}$   
 b.  $y = -\frac{7}{3}x - \frac{41}{7}$       d.  $y = -\frac{3}{7}x + \frac{41}{7}$



Use a graphing calculator to find the equation of the line of best fit for the data. Find the value of the correlation coefficient  $r$ . Predict the missing value in the table.

22. John's Best Discus Throws

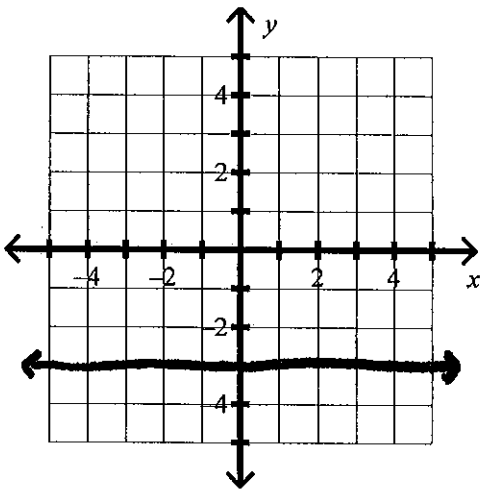
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Distance (meters)	69.08	69.18	69.80	70.24	70.86	71.16	71.86	72.08	?

- a.  $y = 0.465x - 862.515$ ,  $r = 0.994$ ; 71.67
- b.  $y = 2.086x + 1857.375$ ,  $r = 0.994$ ; 73.09
- c.  $y = 0.465x + 862.515$ ,  $r = 0.994$ ; 74.09
- d.  $y = -0.465x + 862.515$ ,  $r = 0.994$ ; 72.05

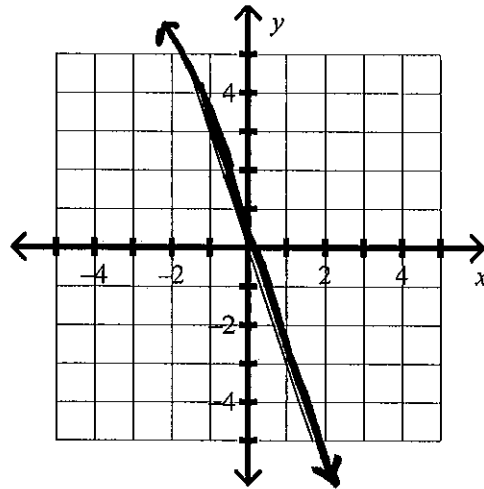
What is the graph of the equation?

23.  $y = -3$

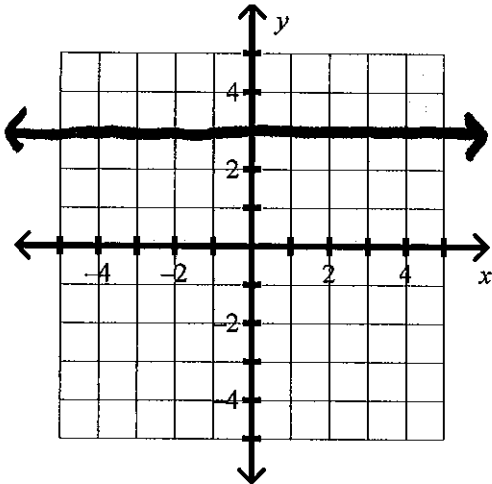
a.



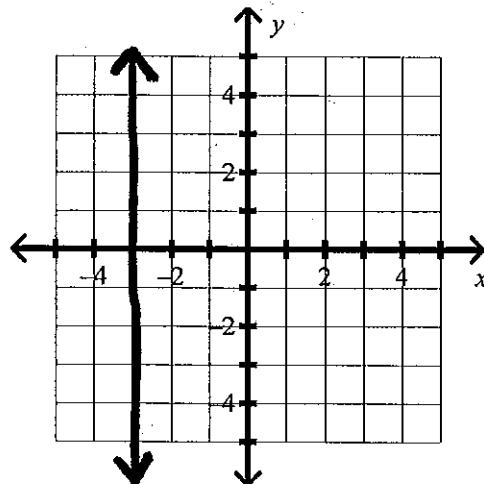
c.



b.

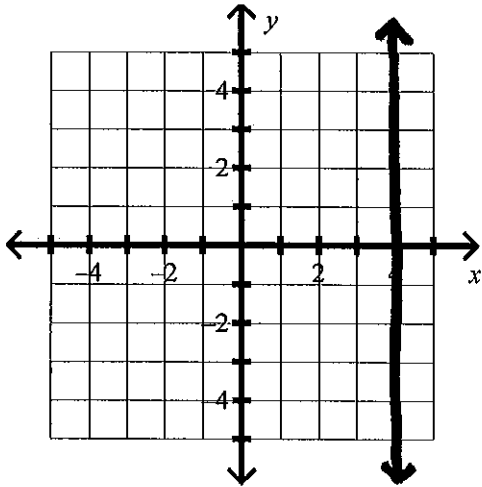


d.

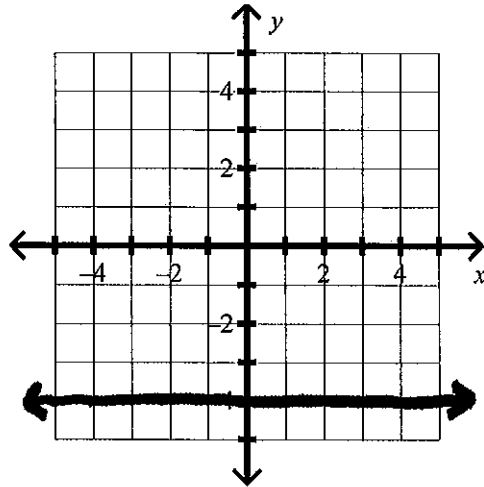


24.  $x = -4$

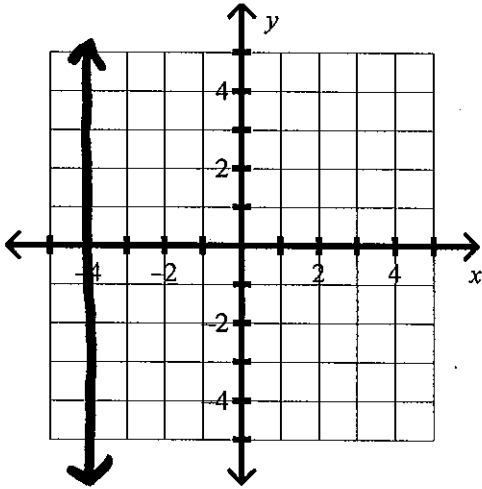
a.



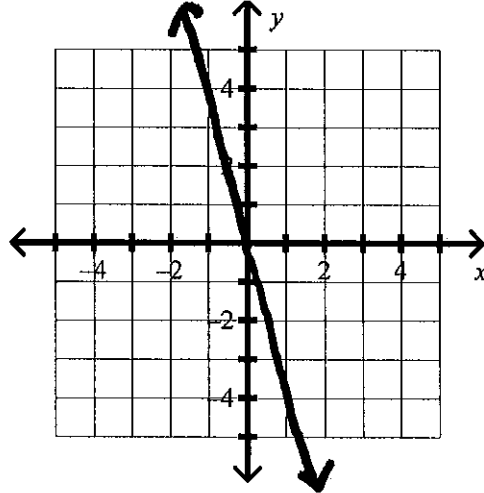
c.



b.



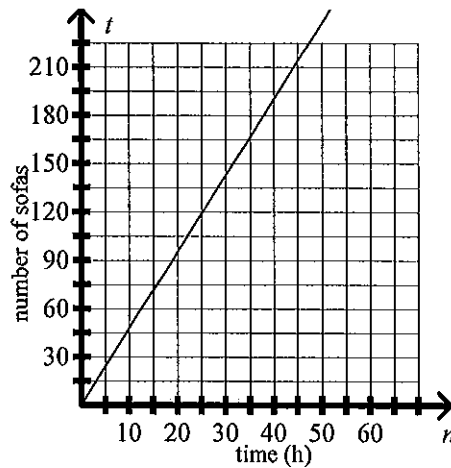
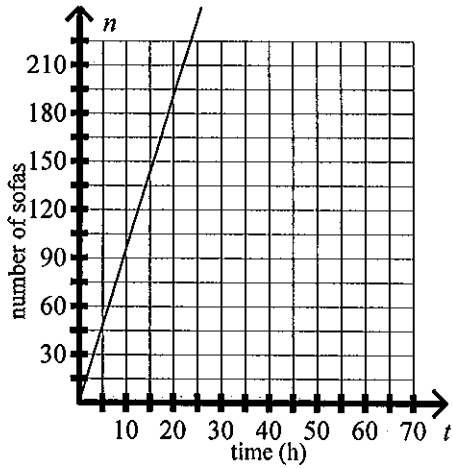
d.



25. The number of sofas a factory produces varies directly with the number of hours the machinery is operational. Suppose the factory can produce 455 sofas in 48 hours. What is an equation that relates the number of sofas produced,  $n$ , with the amount of time,  $t$ , in hours? What is the graph of your equation?

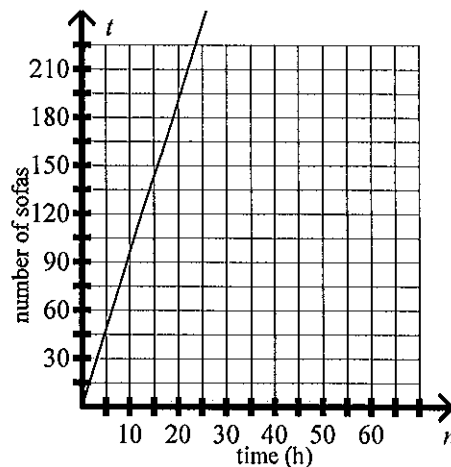
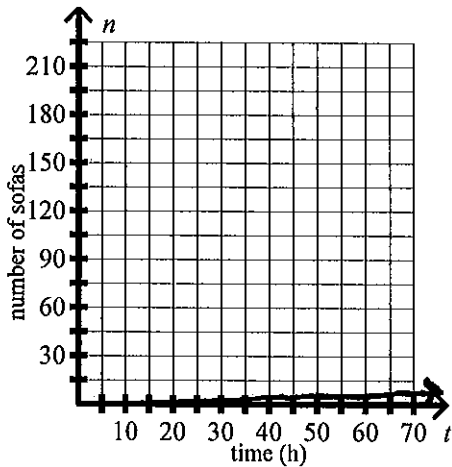
a.  $n = 9.48t$

c.  $t = 4.74n$



b.  $n = 0.11t$

d.  $t = 9.48n$



**Find the  $x$ - and  $y$ -intercept of the line.**

26.  $x - 6y = 12$

a.  $x$ -intercept is 12;  $y$ -intercept is  $-2$

b.  $x$ -intercept is  $-6$ ;  $y$ -intercept is 1

c.  $x$ -intercept is  $-2$ ;  $y$ -intercept is 12

d.  $x$ -intercept is 1;  $y$ -intercept is  $-6$

27.

Hours Studying	1	2	3	4	5	6	7	8	9
Exam Mark (%)	65	67	73	74	77	80	84	85	?

- a.  $y = 62.286x + 2.964$ ,  $r = 0.991$ ; about 95%  
 b.  $y = 3x + 65$ ,  $r = 0.951$ ; about 92%  
 c.  $y = 2.964x + 62.286$ ,  $r = 0.991$ ; about 89%  
 d.  $y = 2.964x + 62.286$ ,  $r = 0.991$ ; about 99%

**What are the slope and  $y$ -intercept of the graph of the given equation?**

28.  $y = -9x + 2$ 

- a. The slope is 9 and the  $y$ -intercept is  $-2$ .  
 b. The slope is  $-9$  and the  $y$ -intercept is 2.  
 c. The slope is  $-2$  and the  $y$ -intercept is  $-9$ .  
 d. The slope is 2 and the  $y$ -intercept is  $-9$ .

**For the data in the table, does  $y$  vary directly with  $x$ ? If it does, write an equation for the direct variation.**

29.

$x$	$y$
16	4
32	16
48	36

- a. yes;  $y = 2x$   
 b. yes;  $y = 4x$   
 c. yes;  $y = 8x$   
 d. no;  $y$  does not vary directly with  $x$

30. The table shows the height of an elevator above ground level after a certain amount of time. Model the data with an equation. Let  $y$  stand for the height of the elevator in feet and let  $x$  stand for the time in seconds.

Time (s)	Height (ft)
10	156
20	142
40	114
60	86

- a.  $y = -1.4x + 170$   
 b.  $y = 170x - 1.4$   
 c.  $y = -1.4 + 156$   
 d.  $y = 10x + 156$

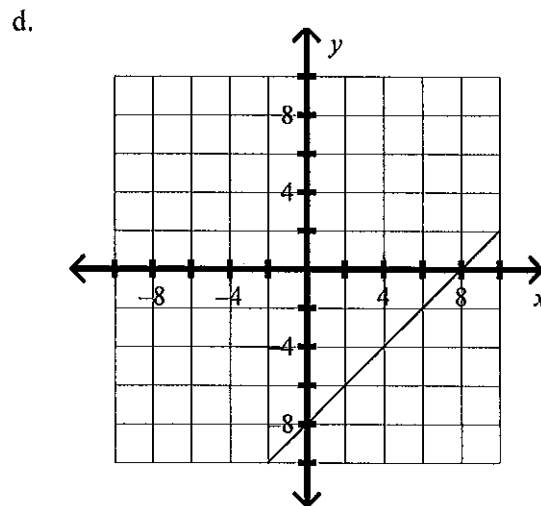
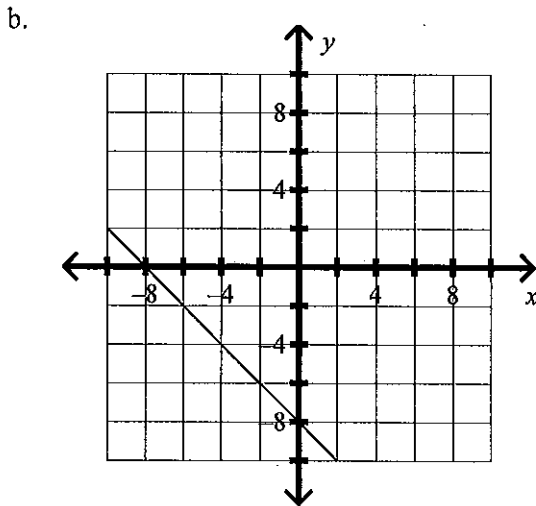
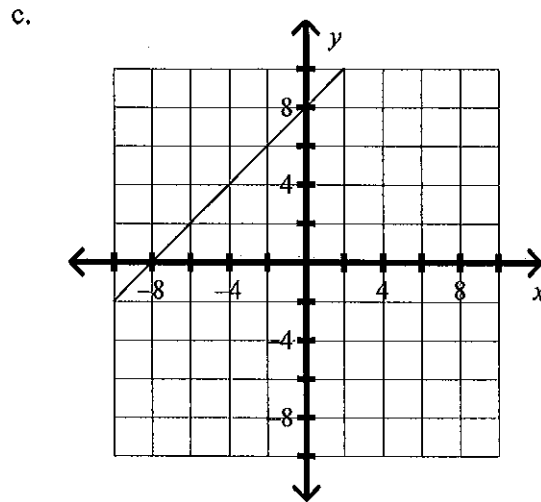
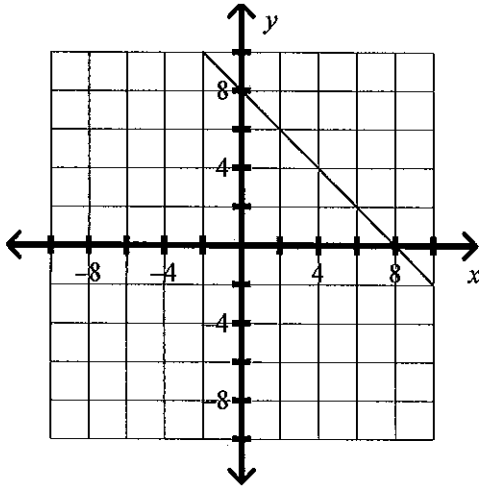


What are the slope and  $y$ -intercept of the graph of the given equation?

- \_\_\_\_\_ 5.  $y = -3x - 6$
- The slope is 3 and the  $y$ -intercept is 6.
  - The slope is  $-6$  and the  $y$ -intercept is  $-3$ .
  - The slope is  $-3$  and the  $y$ -intercept is  $-6$ .
  - The slope is 6 and the  $y$ -intercept is  $-3$ .

Match the equation with its graph.

- \_\_\_\_\_ 6.  $8x - 8y = -64$
- 



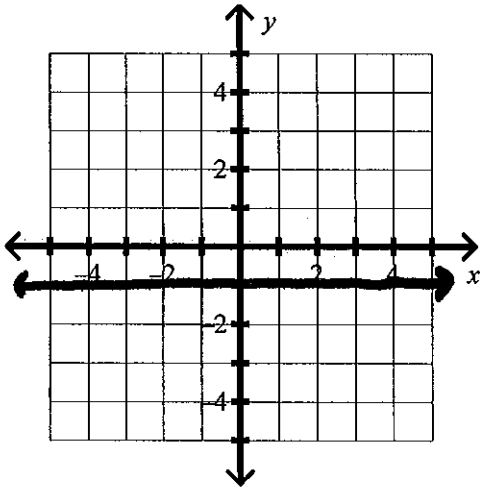
Find the  $x$ - and  $y$ -intercept of the line.

- \_\_\_\_\_ 7.  $4x + 8y = 24$
- $x$ -intercept is 6;  $y$ -intercept is 3
  - $x$ -intercept is 4;  $y$ -intercept is 8
  - $x$ -intercept is 8;  $y$ -intercept is 4
  - $x$ -intercept is 3;  $y$ -intercept is 6

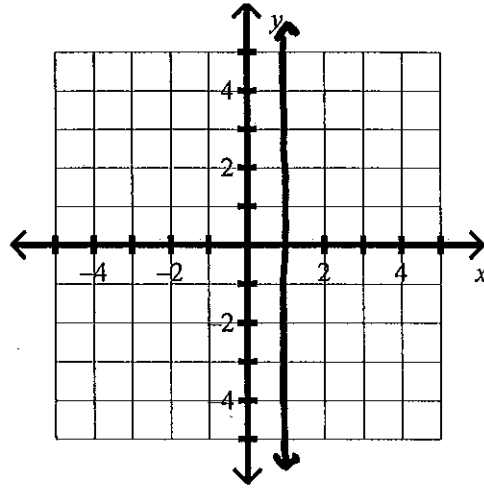
What is the graph of the equation?

8.  $x = -1$

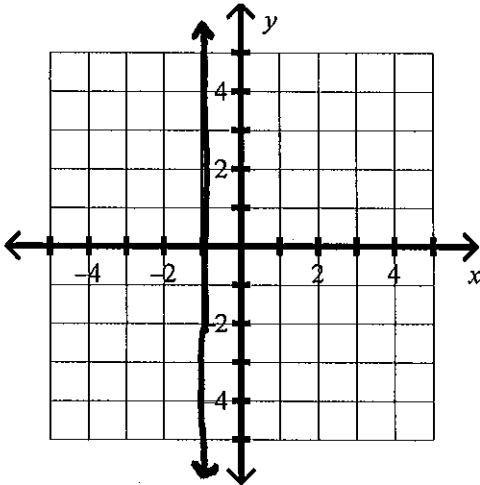
a.



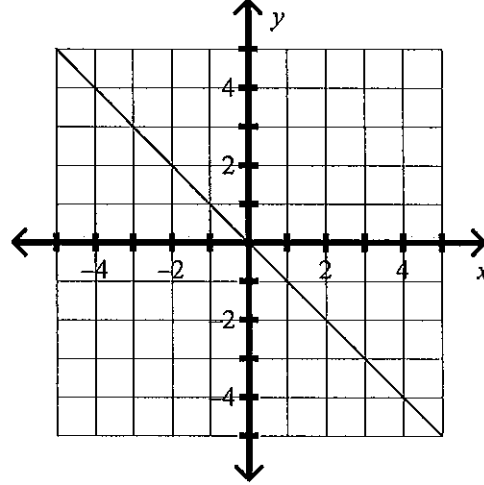
c.



b.

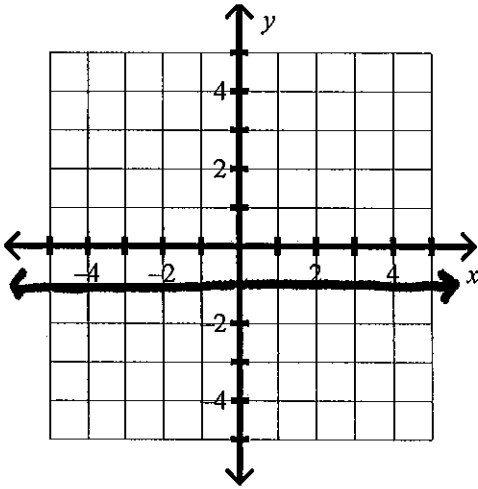


d.

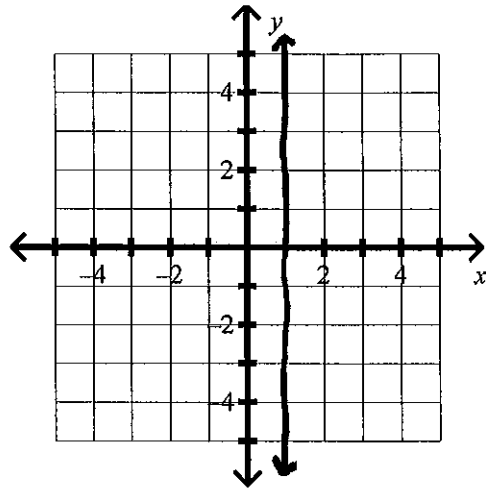


9.  $y = 1$

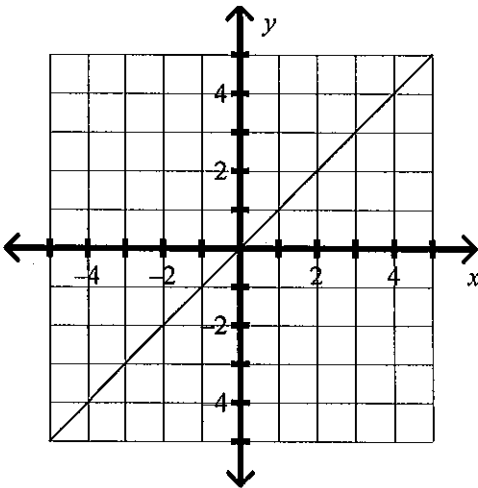
a.



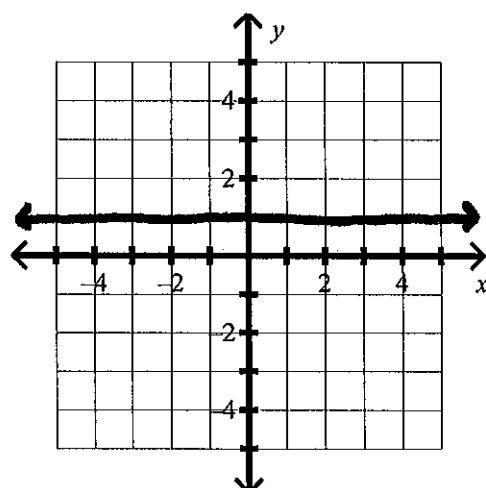
c.



b.

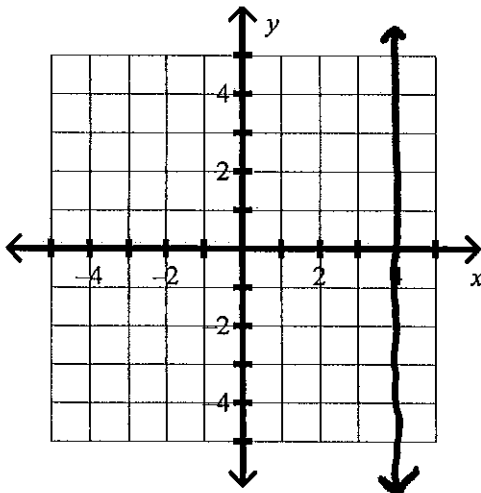


d.



What is the slope of the line?

10.



a. undefined

b. 0



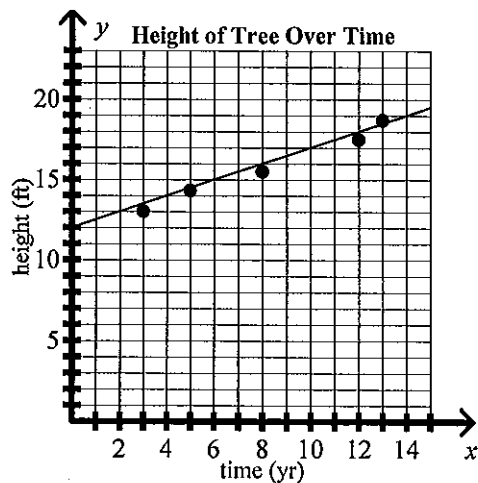


15.

Hours Studying	1	2	3	4	5	6	7	8	9
Exam Mark (%)	65	67	73	74	77	80	84	85	?

- a.  $y = 2.964x + 62.286, r = 0.991$ ; about 99%
- b.  $y = 2.964x + 62.286, r = 0.991$ ; about 89%
- c.  $y = 62.286x + 2.964, r = 0.991$ ; about 95%
- d.  $y = 3x + 65, r = 0.951$ ; about 92%

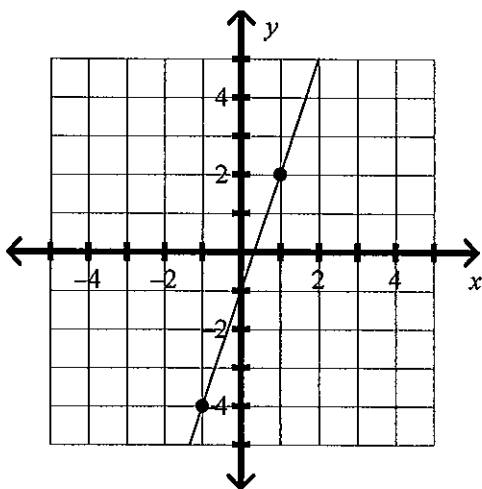
16. The scatter plot below shows the height of a tree over time. What is the approximate height of the tree after 12 years?



- a. 14 ft
- b. 21 ft
- c. 19 ft
- d. 18 ft

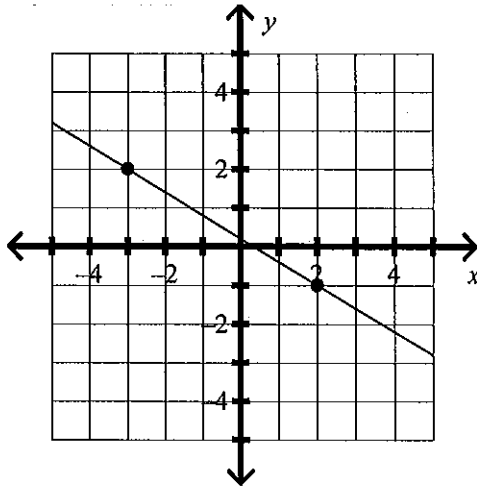
Write the slope-intercept form of the equation for the line.

17.



- a.  $y = \frac{1}{3}x + 1$
- b.  $y = -3x - 1$
- c.  $y = \frac{1}{3}x - 1$
- d.  $y = 3x - 1$

18.



a.  $y = \frac{3}{5}x + \frac{1}{5}$

c.  $y = -\frac{5}{3}x + \frac{1}{5}$

b.  $y = -\frac{3}{5}x + \frac{1}{5}$

d.  $y = \frac{1}{5}x + \frac{3}{5}$

Does the equation represent a direct variation? If so, find the constant of variation.

19.  $3x - y = 0$

a. no

b. yes;  $k = -3$

c. yes;  $k = -1$

d. yes;  $k = 3$

20.  $2x^2 - y = 0$

a. yes;  $k = 2$

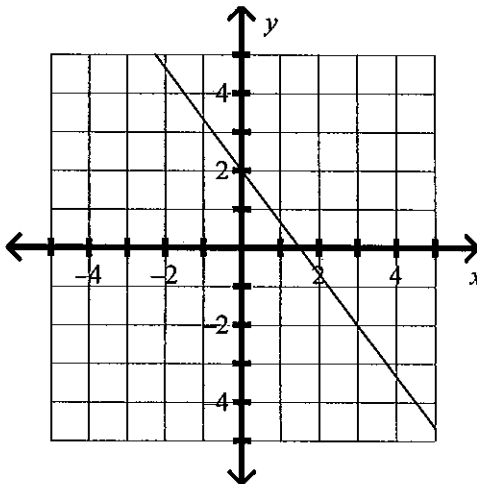
b. no

c. yes;  $k = -\frac{1}{2}$

d. yes;  $k = -2$

Find the slope of the line.

21.



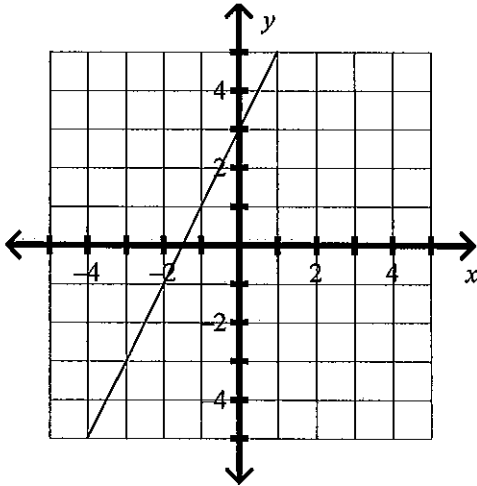
a.  $\frac{3}{4}$

b.  $\frac{4}{3}$

c.  $-\frac{4}{3}$

d.  $-\frac{3}{4}$

22.



- a.  $-2$                       b.  $2$                       c.  $-\frac{1}{2}$                       d.  $\frac{1}{2}$

What equation in slope intercept form represents the line that passes through the two points?

23.  $(4, 7), (8, 1)$ 

- a.  $y = \frac{3}{2}x - 13$                       c.  $y = \frac{2}{3}x + 13$   
 b.  $y = -\frac{2}{3}x - 13$                       d.  $y = -\frac{3}{2}x + 13$

24.  $(-1.4, -7.2), (2.6, 12.8)$ 

- a.  $y = -5x - 0.2$                       c.  $y = 5x - 0.2$   
 b.  $y = 0.2x + 0.2$                       d.  $y = -0.2x + 0.2$

Use a graphing calculator to find the equation of the line of best fit for the data. Find the value of the correlation coefficient  $r$ . Predict the missing value in the table.

25. John's Best Discus Throws

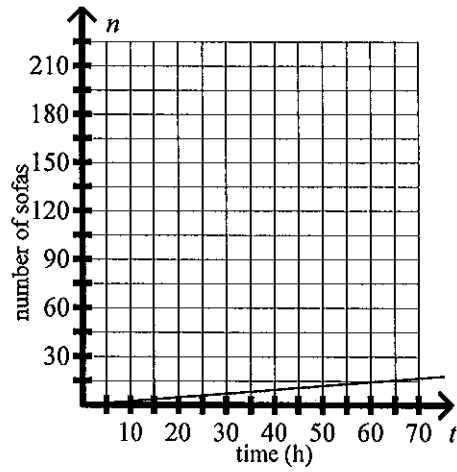
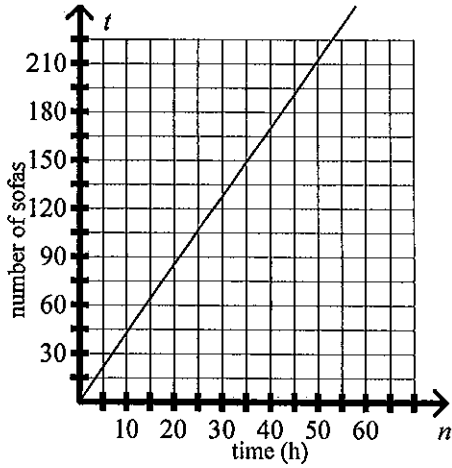
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Distance (meters)	69.08	69.18	69.80	70.24	70.86	71.16	71.86	72.08	?

- a.  $y = -0.465x + 862.515, r = 0.994; 72.05$   
 b.  $y = 2.086x + 1857.375, r = 0.994; 73.09$   
 c.  $y = 0.465x - 862.515, r = 0.994; 71.67$   
 d.  $y = 0.465x + 862.515, r = 0.994; 74.09$

26. The number of sofas a factory produces varies directly with the number of hours the machinery is operational. Suppose the factory can produce 182 sofas in 43 hours. What is an equation that relates the number of sofas produced,  $n$ , with the amount of time,  $t$ , in hours? What is the graph of your equation?

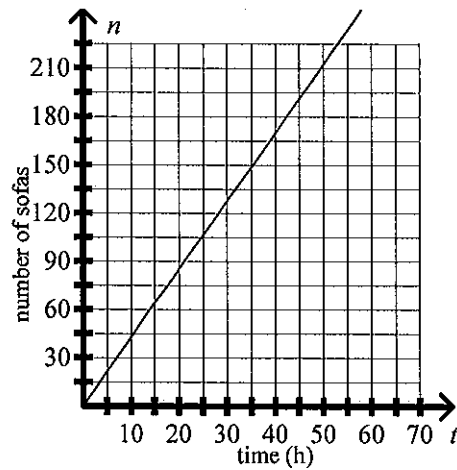
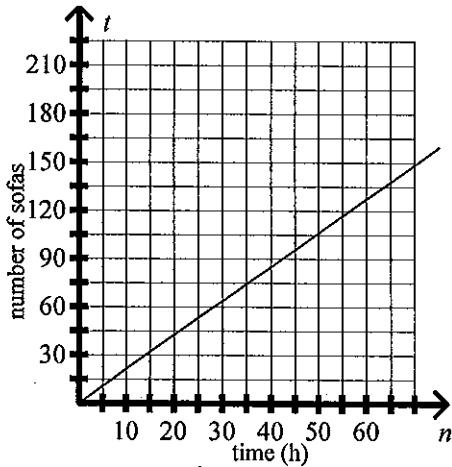
a.  $t = 4.23n$

c.  $n = 0.24t$



b.  $t = 2.12n$

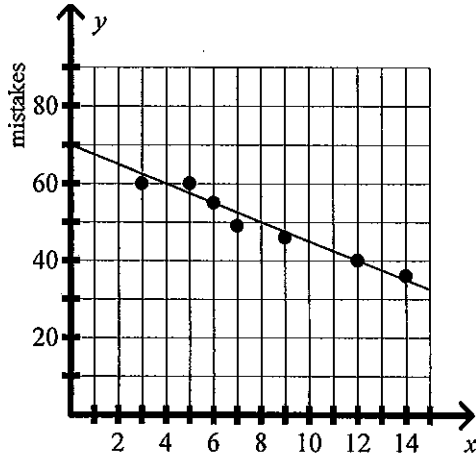
d.  $n = 4.23t$



Name: \_\_\_\_\_

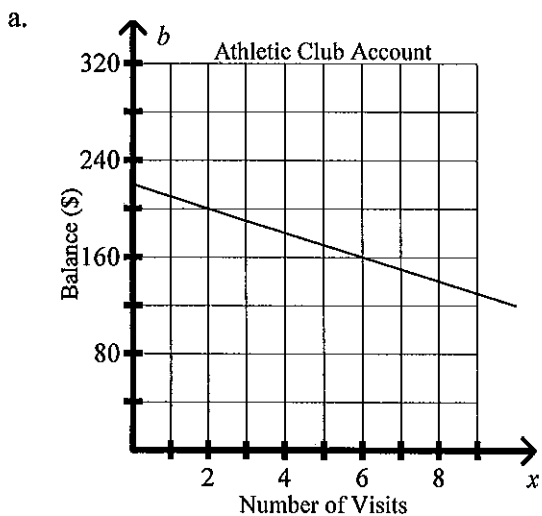
ID: B

27. The scatter plot shows the number of mistakes a piano student makes during a recital versus the amount of time the student practiced for the recital. How many mistakes do you expect the student to make at the recital after 2 hours of practicing?

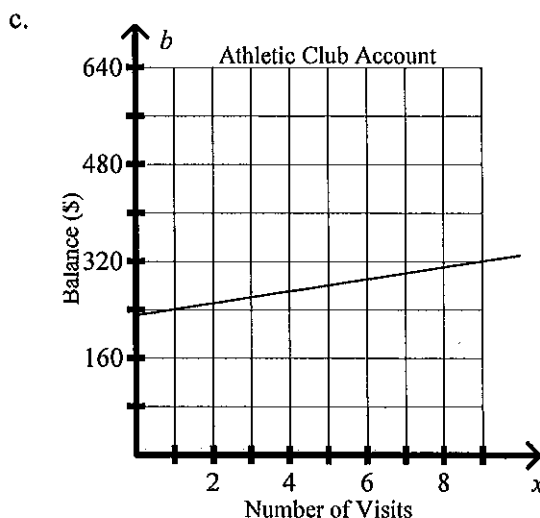


- a. 55 mistakes  
b. 65 mistakes  
c. 17 mistakes  
d. 71 mistakes

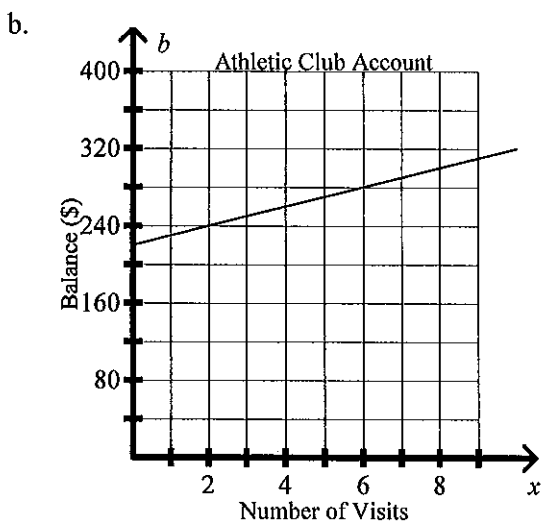
28. Giselle pays \$220 in advance on her account at the athletic club. Each time she uses the club, \$10 is deducted from the account. Model the situation with a linear function and a graph.



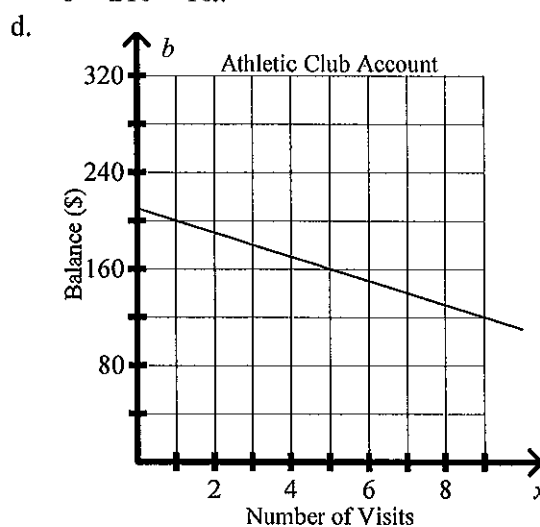
$$b = 220 - 10x$$



$$b = 210 + 10x$$



$$b = 220 + 10x$$



$$b = 210 - 10x$$

For the data in the table, does  $y$  vary directly with  $x$ ? If it does, write an equation for the direct variation.

29.

$x$	$y$
7	2
14	8
21	18

- a. yes;  $y = 3.5x$                       c. yes;  $y = 7x$   
b. no;  $y$  does not vary directly with  $x$                       d. yes;  $y = 1.75x$

Write an equation of a line with the given slope and  $y$ -intercept.

30.  $m = -\frac{1}{6}$ ,  $b = \frac{2}{3}$ 

- a.  $y = -6x + \frac{2}{3}$                       c.  $y = -\frac{1}{6}x - \frac{2}{3}$   
b.  $y = -\frac{1}{6}x + \frac{2}{3}$                       d.  $y = \frac{2}{3}x - \frac{1}{6}$