

1. Find the slope and the y-intercept of the line with the following equation.

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

Find the slope of the line. Select the correct choice below and, if necessary, fill in the answer box.

- ☐ A. The slope is .
- (Type an integer or a simplified fraction.)
- ☐ B. The slope is undefined.

Find the y-intercept of the line. Select the correct choice below and, if necessary, fill in the answer box.

- ☐ A. The y-intercept is .
- (Type an ordered pair.)
- ☐ B. There is no y-intercept.

2. Find the slope and the y-intercept of the line with the following equation.

$$5x + 9y = 11$$

Find the slope of the line. Select the correct choice below and, if necessary, fill in the answer box.

- ☐ A. The slope is .
- (Type an integer or a simplified fraction.)
- ☐ B. The slope is undefined.

Find the y-intercept of the line. Select the correct choice below and, if necessary, fill in the answer box.

- ☐ A. The y-intercept is $(0, \text{ })$.
- (Simplify your answer. Type an integer or a fraction.)
- ☐ B. There is no y-intercept.

3.

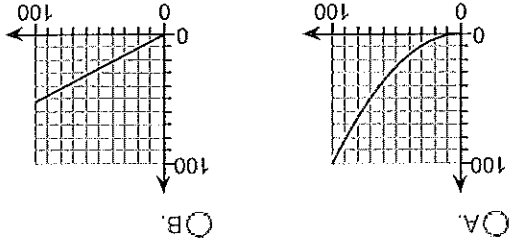
A car is traveling at a rate of r miles per hour. When the driver sees a crossing guard, his reaction time is such that he travels a distance of D feet before coming to a stop. The distance D is a linear function of r , given by the formula

$$D(r) = \frac{25r + 12}{24}.$$

What is the slope of this line?

(Round to the nearest tenth.)

Choose the correct graph of D .



☐ C.

☐ D.

Find $D(5)$, $D(20)$ and $D(50)$.

$D(5) =$

$D(20) =$

$D(50) =$

(Round to the nearest tenth.)

What is the domain of this function?

☐ A. $(24, \infty)$

☐ B. $(-\infty, \infty)$

☐ C. $[0, \infty)$

☐ D. $(0, \infty)$

4.

A person buys a phone for \$87 and signs up for a single-line phone plan with 2000 monthly anytime minutes. The plan costs \$115.99 per month. Write an equation that can be used to determine the total cost, $C(t)$, of this phone plan for t months. Then, find the cost for 22 months, assuming that the number of minutes the person uses does not exceed 2000 per month.

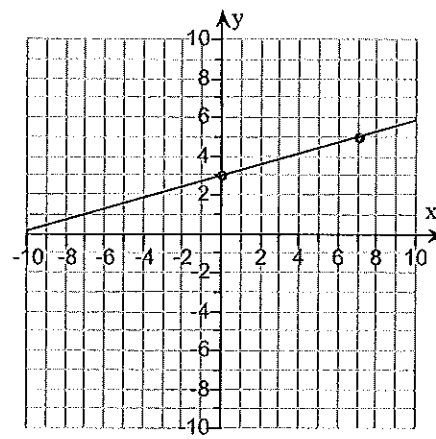
An equation that can be used to determine the total cost, $C(t)$, of the phone plan for t months is $C(t) =$.

(Use integers or decimals for any numbers in the expression.)

The cost for 22 months, assuming that the number of minutes the person uses does not exceed 2000 per month, is \$.

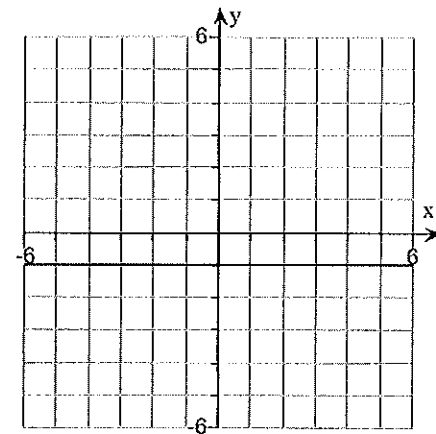
5.

Write an equation for the line shown on the right.

The equation of the line is $y = \square$.(Type an expression using x as the variable. Simplify your answer. Use integers or fractions for any numbers in the expression.)

6.

Write the equation for the graph.

The correct equation is $\square$.

7.

Find an equation of the line having the given slope and containing the given point.

$$m = \frac{7}{8}, (5, -9)$$

The equation of the line is $y = \square$.(Type an expression using x as the variable. Simplify your answer. Use integers or fractions for any numbers in the expression.)

8.

Find an equation of the line containing the given pair of points.

(1,4) and (3,5)

 $y = \square$

(Simplify your answer. Type your answer in slope-intercept form. Use integers or fractions for any numbers in the expression.)

9. Write equations of the horizontal and the vertical lines that pass through the point $(-4, -8)$.

- What is the equation of the horizontal line?
- ☐ A. $y = -8$
☐ B. $x = -4$
☐ C. $y = -4$
☐ D. $x = -8$

- What is the equation of the vertical line?
- ☐ A. $y = -8$
☐ B. $y = -4$
☐ C. $x = -4$
☐ D. $x = -8$

10. Find a linear function f given $f(1) = 3$ and $f(3) = 4$.

The linear function is $f(x) = \square$.

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

11. Write a slope-intercept equation for a line passing through the point $(14, 12)$ that is parallel to $y = \frac{1}{2}x + 6$. Then write a second equation for a line passing through the given point that is perpendicular to the given line.

Which answer below is correct?

- ☐ A. parallel: $y = \frac{1}{2}x + 5$ perpendicular: $y = 2x + 40$
☐ B. parallel: $y = \frac{1}{2}x + 5$ perpendicular: $y = -2x + 40$
☐ C. parallel: $y = \frac{1}{2}x + 12$ perpendicular: $y = -2x + 12$

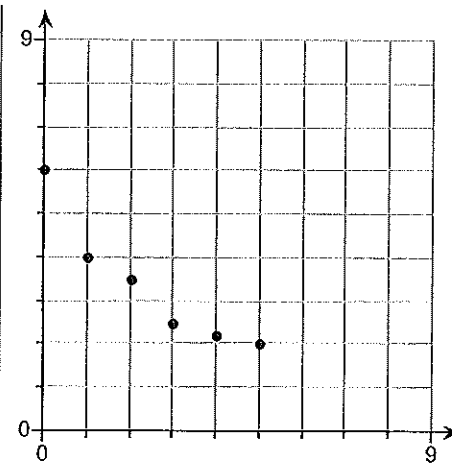
12.

Determine whether the scatterplot on the right might be modeled by a linear function.

Can the scatterplot be reliably modeled by a linear function?

☐ Yes

☐ No



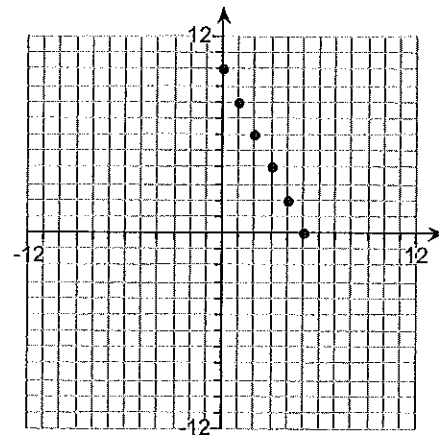
13.

Determine whether the scatterplot on the right might be modeled by a linear function.

Can the scatterplot be reliably modeled by a linear function?

☐ Yes

☐ No



Fit a regression line to the data shown in the chart, and find the coefficient of correlation for the line. Use the regression line to predict life expectancy in the year 2020, where x is the number of decades after 1900.

year, x	life expectancy, y
0 (1900)	48.8 years
2 (1920)	51.1 years
4 (1940)	52.7 years
6 (1960)	53.9 years
8 (1980)	54.9 years

Choose the regression line.

- ☐ A. $y = 0.750x + 49.28$
- ☐ B. $y = 49.28$
- ☐ C. $y = 49.28x + 0.750$
- ☐ D. $y = 0.750x - 49.28$

The coefficient of correlation rounded to three decimal places is .

Is the regression line a good fit?

- ☐ Yes
- ☐ No

The life expectancy in the year 2020, rounded to one decimal place is .

15.

For the data given below, answer parts (a) through (d).

x	-2	-1	0	1	2
y	-4	-1	1	4	6

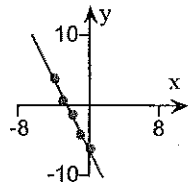
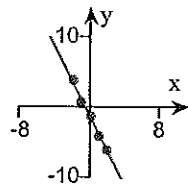
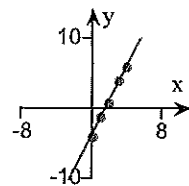
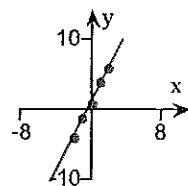
(a) Find the equation of the line containing the first and the last data points.

y =

(Type your answer in slope-intercept form. Use integers or fractions for any numbers in the expression.)

(b) Draw a scatter diagram and the line found in part (a) on the same axes.

Choose the correct graph below.

☐ A.☐ B.☐ C.☐ D.

(c) Use a graphing utility to find the line of best fit.

Which of the following is the equation of the line of best fit?

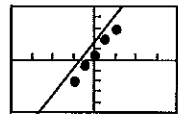
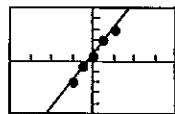
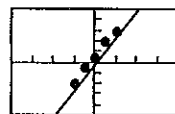
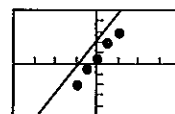
☐ A. $y = 2.5x + 1.2$

☐ B. $y = 2.5x - 1.2$

☐ C. $y = -2.5x - 1.2$

☐ D. $y = -2.5x + 1.2$

(d) Use a graphing utility to draw the scatter diagram and graph the line of best fit on it.

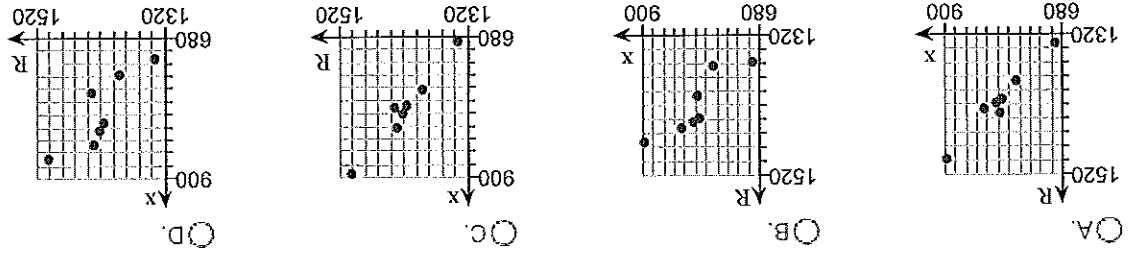
Choose the correct graph below. The viewing window for each graph is $[-8, 8, 2]$ by $[-10, 10, 2]$.☐ A.☐ B.☐ C.☐ D.

The data in the table below represents the square footage and rents (dollars per month) for apartments in a section of a large city. Complete parts (a) through (c) below.

Square Footage, x	Rent per Month, R
690	1335
765	1390
826	1430
794	1435
803	1420
896	1500
790	1415

(a) Using a graphing utility, draw a scatter diagram of the data treating square footage as the independent variable. What type of relation appears to exist between square footage and rent?

Which graph below is a scatter diagram of the data?



Which sentence below best describes the relation between square footage and rent?

- ☐ A. There appears to be a quadratic relation between square footage and rent.
- ☐ B. There appears to be a linear relation between square footage and rent.
- ☐ C. There does not appear to be any relation between square footage and rent.

(b) Based on your response to part (a), find either a linear or quadratic model that describes the relation between square footage and rent.

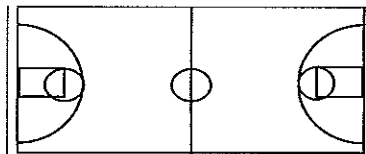
Which equation below best describes the relation between square footage and rent?

- ☐ A. $R = 0.786x + 793$
- ☐ B. $R = 793x + 0.786$
- ☐ C. $R = 0.000041x^2 + 0.721x + 819$
- ☐ D. $R = 0.000041x + 819$
- ☐ E. $R = 0.786x^2 + 0.721x + 793$
- ☐ F. $R = 0.721x^2 + 0.000041x + 819$
- ☐ G. There is no relation.

(c) Use the model you selected in part (b) to predict the rent of an apartment in the section that is 880 square feet.

The predicted rent of an apartment with 880 square feet is about \$.

(Use the answer from part (b) to find this answer. Round to the nearest whole number as needed.)

17. Solve using the principles together. Don't forget to check.
- $$8(4x + 6) = 11 - (x + 7)$$
- What is the solution? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.
- ☐ A. The solution is $x = \square$. (Type an integer or a simplified fraction.)
- ☐ B. The solution is all real numbers.
- ☐ C. There is no solution.
-
18. Money is borrowed at 17% simple interest. After one year, \$1023.75 pays off the loan. How much was originally borrowed?
- The amount of the original loan was \$.
-
19. Ryan, a consumer electronics salesperson, earns a base salary of \$1100 per month and a commission of 8% on the amount of sales he makes. One month Ryan received a \$1764 paycheck. Find the amount of his sales for the month.
- Ryan had sales of \$ for the month.
-
20. A lady worked 44 hr one week and earned a \$483 paycheck. She earns time and a half (1.5 times her regular hourly wage) for the number of hours she works in excess of 40. What is her regular hourly wage?
- Her regular hourly wage is \$.
- (Type an integer or a decimal.)
-
21. The perimeter of a college athletic field is 96 meters and the length is 14 m more than the width. Find the length and width.
- 
- What is the width? m
- What is the length? m

22. A truck enters a highway driving 60 mph. A car enters the highway at the same place 8 minutes later and drives 68 mph in the same direction. From the time the car enters the highway, how long will it take the car to pass the truck?

The car will pass the truck in minutes.
(Round to the nearest minute.)

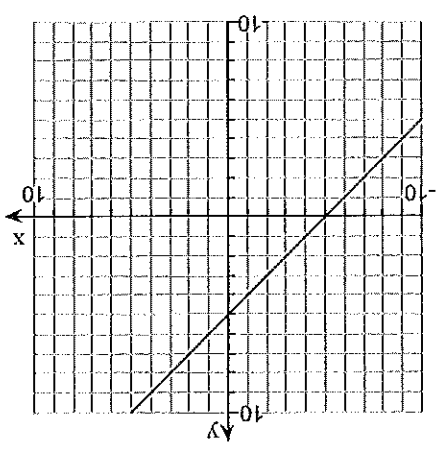
23. A mother wants to invest \$6,000.00 for her son's future education. She invests a portion of the money in a bank certificate of deposit (CD account) which earns 4% and the remainder in a savings bond that earns 7%. If the total interest earned after one year is \$360.00, how much money was invested in the CD account?

The total interest earned after one year is \$360.00.
How much money was invested in the CD account? \$
(Round to the nearest cent, if necessary.)

24. Find the zero of the linear function.

$f(x) = -2x + 3$
 $x =$ (Simplify your answer.)

25. Use the given graph to find each of the following.
a) the zero of the function
b) the x-intercept
What is the zero of the function?
What is the x-intercept?
(Type an ordered pair.)



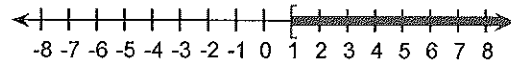
26. Solve the inequality. Then write the solution set in interval notation, and choose the correct graph.

$$7x + 2 + x \geq 1 + 5x + 4$$

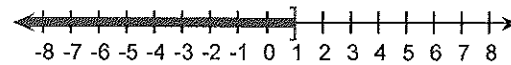
The solution set is . (Type your answer in interval notation.)

Choose the correct graph below.

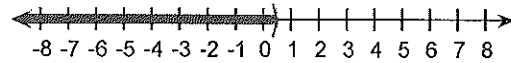
☐ A.



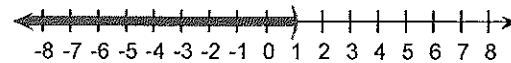
☐ B.



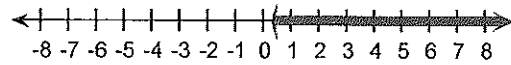
☐ C.



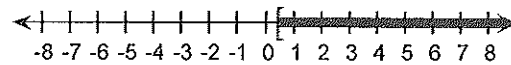
☐ D.



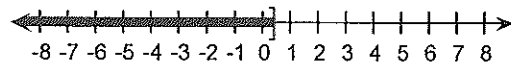
☐ E.



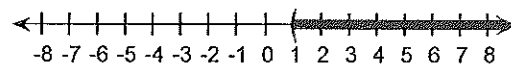
☐ F.



☐ G.



☐ H.



27. Solve and graph.

$$-6 < 4 - 2x \leq 12$$

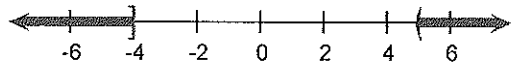
Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set in interval notation is .

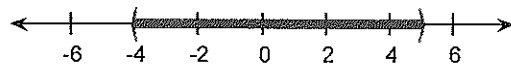
☐ B. There is no solution.

Choose the graph of the solution set.

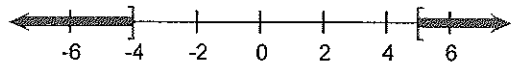
☐ A.



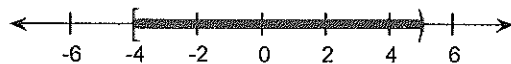
☐ B.



☐ C.



☐ D.



28.

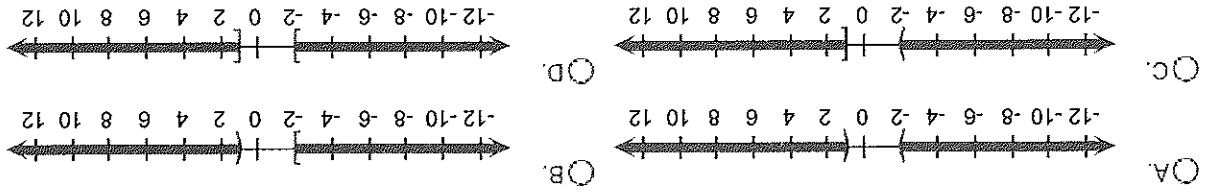
Solve and write interval notation for the solution set. Then graph the solution set.

$$9x \leq -18 \quad \text{or} \quad x - 1 > 0$$

Choose the correct solution set below.

- ☐ A. $[-2, 1]$
☐ B. $[-2, 1)$
☐ C. $(-\infty, -2) \cup [1, \infty)$
☐ D. $(-\infty, -2] \cup (1, \infty)$

Choose the correct graph below.



30.

Curt can be paid in one of two ways for the furniture he sells. Plan A: Salary of \$950 per month, plus a commission of 10% of sales. Plan B: Salary of \$1350 per month, plus a commission of 15% of sales in excess of \$9000. For what amount of monthly sales is plan B better than plan A, assuming Curt's sales are always more than \$9000?

Plan B is better than Plan A when Curt's sales are more than \$.