1. The weights and heights of six mathematics students are given in the table.

<table>
<thead>
<tr>
<th>Weight (lb.)</th>
<th>Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>157</td>
<td>169</td>
</tr>
<tr>
<td>121</td>
<td>155</td>
</tr>
<tr>
<td>218</td>
<td>181</td>
</tr>
<tr>
<td>175</td>
<td>176</td>
</tr>
<tr>
<td>157</td>
<td>165</td>
</tr>
<tr>
<td>147</td>
<td>167</td>
</tr>
</tbody>
</table>

Answer parts a through e.

a. In the statement "Height is a function of weight," which is the independent variable and which is the dependent variable?

- A. The independent variable is weight and the dependent variable is height.
- B. The independent variable is height and the dependent variable is weight.

b. Is height a function of weight for the six students? Explain using the definition of function.

- A. No, because there is a value in the height column for which there are two different values assigned in the weight column.
- B. Yes, because for each value in the height column, there is one and only one value assigned in the weight column.
- C. No, because there is a value in the weight column for which there are two different values assigned in the height column.
- D. Yes, because for each value in the weight column, there is one and only one value assigned in the height column.

c. In the statement "Weight is a function of height," which is the independent variable and which is the dependent variable?

- A. The independent variable is height and the dependent variable is weight.
- B. The independent variable is weight and the dependent variable is height.

d. Is weight a function of height for the six students? Explain using the definition of function.

- A. No, because there is a value in the height column for which there are two different values assigned in the weight column.
- B. Yes, because for each value in the height column, there is one and only one value assigned in the weight column.
- C. Yes, because for each value in the weight column, there is one and only one value assigned in the height column.
- D. No, because there is a value in the weight column for which there are two different values assigned in the height column.

e. In general, is weight a function of height? Explain.

- A. Yes, because persons with different weights must have different heights.
- B. Yes, because persons with different heights must have different weights.
- C. No, because there can be persons with the same weight and different heights.
- D. No, because there can be persons with the same height and different weights.

ID: 3.1.1
2. Does the table describe $y$ as a function of $x$?

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-6</td>
</tr>
<tr>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>-1</td>
</tr>
<tr>
<td>3</td>
<td>-6</td>
</tr>
</tbody>
</table>

○ Yes
○ No

ID: 3.1.2a

3. Determine whether $S$, given by the table below, defines a function.

<table>
<thead>
<tr>
<th>$x$</th>
<th>1</th>
<th>10</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Does the table describe the relation $S$ as a function?

○ No
○ Yes

ID: 3.1.2b
4. Determine whether the relation represents a function. State the domain and the range of the relation.

<table>
<thead>
<tr>
<th>First names</th>
<th>Last names</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>Doe</td>
</tr>
<tr>
<td>Katie</td>
<td>Smith</td>
</tr>
<tr>
<td>Kia</td>
<td>Hill</td>
</tr>
<tr>
<td>Marsha</td>
<td>Brady</td>
</tr>
<tr>
<td>Jan</td>
<td></td>
</tr>
</tbody>
</table>

Does the relation represent a function?

- [ ] Yes
- [ ] No

Select the list that represents the elements of the domain.

- [A] {Marsha, Jan, Brady}
- [B] {John, Katie, Kia, Doe, Smith, Hill}
- [C] {Doe, Smith, Hill, Brady}
- [D] {John, Katie, Kia, Marsha, Jan}

Select the list that represents the elements of the range.

- [A] {Doe, Smith, Hill, John, Katie, Kia}
- [B] {Doe, Smith, Hill, Brady}
- [C] {Brady, Marsha, Jan}
- [D] {John, Katie, Kia, Marsha, Jan}

ID: 3.1.3a
5. Determine whether the relation represents a function. State the domain and the range of the relation.

\[ \begin{array}{c|c}
\text{Letters} & \text{Letters} \\
\hline
Y & Z \\
B & A \\
D & C \\
\end{array} \]

Does the relation represent a function?

○ Yes
○ No

Select the list that represents the elements of the domain.

○ \{Z, A, C\}
○ \{Y, B, D\}
○ \{C, B, D\}
○ \{Z, A, Y\}

Select the list that represents the elements of the range.

○ \{Z, A, C\}
○ \{B, D, C\}
○ \{Y, Z, A\}
○ \{Y, B, D\}

ID: 3.1.3b

6. Use the graph of the function \( f \) shown to the right to answer parts (a) through (d).

(a) Find \( f(-14) \).
\[ f(-14) = \]

(b) Find \( f(-6) \).
\[ f(-6) = \]

(c) Find \( f(12) \).
\[ f(12) = \]

(d) For what number(s) of \( x \) is \( f(x) = 6 \)?
\[ \]

(Use a comma to separate answers as needed.)

ID: 3.1.12
7. The table shows a 1998 projection for online shopping per U.S. online household through 2004. Use the points (2000,1250) and (2001,1500) in the table to find the average rate of change from 2000 to 2001.

<table>
<thead>
<tr>
<th>Input</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>1000</td>
<td>1250</td>
<td>1500</td>
<td>2300</td>
<td>3100</td>
<td>3900</td>
</tr>
</tbody>
</table>

What is the average rate of change from 2000 to 2001?

__________ dollars/year

ID: 3.2.2

8. The following table of data gives the median age of a man in a certain country at the time of his first marriage.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Age</td>
<td>25.5</td>
<td>24.7</td>
<td>24.3</td>
<td>24.3</td>
<td>22.3</td>
<td>22.3</td>
<td>23.2</td>
<td>24.9</td>
<td>26.3</td>
<td>26.8</td>
<td>27.6</td>
</tr>
</tbody>
</table>

During what ten-year period did the average age increase the most?

The average age increased the most during the period (1) ____________

(1)  

ID: 3.2.4
9. The following table of data gives the median age of a man in a certain country at the time of his first marriage.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Age</td>
<td>25.9</td>
<td>24.6</td>
<td>24.1</td>
<td>24.1</td>
<td>22.4</td>
<td>22.4</td>
<td>23.1</td>
<td>24.8</td>
<td>26.2</td>
<td>26.7</td>
<td>27.8</td>
</tr>
</tbody>
</table>

Complete parts a) through c).

a) What does it mean in this situation if the average rate of change is negative?

- **A.** It means the median age of a man at the time of his first marriage decreases during the ten-year period.
- **B.** It means the median age of a man at the time of his first marriage remains constant during the ten-year period.
- **C.** It means the median age of a man at the time of his first marriage increases during the ten-year period.

b) Determine at least one ten-year period when the average rate of change is negative.

- **D.** 1980-1990

c) What trend would one observe in the graph if the average rate of change were negative? That is, would the graph go up, go down, or remain constant?

If the average rate of change were negative, the graph would (1) ____________

- **(1)** remain constant.
- go up.
- go down.

ID: 3.2.5

10. If a new car is valued at $24,000 and 10 years later it is valued at $3000, then what is the average rate of change of its value during those 10 years?

The average rate of change is ____________ dollars per year.

ID: 3.2.8a

11. Let g be a function defined by \( g(x) = 6x - 1 \). Determine the value of x for which \( g(x) = 17 \).

What is the value of x for which \( g(x) = 17 \)?

\[ x = ____________ \] (Simplify your answer.)

ID: 3.3.3b
12. Answer the question about the function \( g(x) = -\frac{1}{2}x + 3 \).

Is the point (4,1) on the graph of the function?

Is the point (4,1) on the graph of the function?

☐ No  
☐ Yes

ID: 3.3.5

13. Suppose \( f(x) = \frac{x}{2 + x^2} \). Which of the following points lie on its graph?

\[
(1,1) \quad (5,27) \quad \left(\frac{1}{2}, \frac{2}{9}\right) \quad (0,5) \quad \left(-5, -\frac{5}{27}\right)
\]

Which of the following points lie on its graph? Select all that apply.

☐ A. (5,27)  
☐ B. (1,1)  
☐ C. (0,5)  
☐ D. \( \left(\frac{1}{2}, \frac{2}{9}\right) \)  
☐ E. \( \left(-5, -\frac{5}{27}\right) \)

ID: 3.3.7

14. The weekly salary of the manager is $500 plus 20% commission on her weekly sales. Complete parts a through c.

a) Write a function expressing her weekly salary, \( s \), in terms of her weekly sales, \( x \).

\[ s(x) = \text{__________} \]

b) What is her weekly salary if her sales were $6,000?

\$ \text{__________}

c) If her weekly salary for the week was $1,100, what were her weekly sales?

\$ \text{__________}

ID: 3.4.3

15. Let \( k \) be a function defined by \( k(w) = 0.4w \). Determine the value of \( w \) for which \( k(w) = 16 \).

\[ w = \text{__________} \quad (\text{Simplify your answer.}) \]

ID: 3.4.6
16. The slope of a street is 0.15. How many feet vertically does it rise over a horizontal distance of 80 feet?

The street rises ____________ feet. (Simplify your answer.)

ID: 3.5.4a

17. The slope for a wheelchair ramp must not exceed $\frac{1}{12}$. The ramp must be 12 inches high. Determine the minimum horizontal length of the ramp so that it meets this requirement.

The minimum horizontal length of the ramp is ____________ inches.

ID: 3.5.5b

18. You are a member of a health and fitness club. A special diet and exercise program has been developed for you by the club’s registered dietitian and your personal trainer. You weigh 182 pounds and would like to lose 2 pounds every week. Complete parts a through e below.

a. Complete the following table of values for your desired weight each week.

<table>
<thead>
<tr>
<th>N, Number of Weeks</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>W(N), Desired Weight (lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Simplify your answers.)

b. Plot the data points. Choose the correct graph below.

- [ ] A.
- [ ] B.
- [ ] C.
- [ ] D.

- [ ] A.
- [ ] B.
- [ ] C.
- [ ] D.

My desired weight is a linear function of time because it has a (1) ____________ average rate of change each week. The slope(average rates of change) is(are) ____________.

(Simplify your answer. Use a comma to separate answers as needed.)

d. What is the practical meaning of slope in this situation?

Every week I hope to (2) ____________ ____________ pounds. (Simplify your answer.)

e. How long will it take to reach your ideal weight of 168 pounds?

It will take ____________ week(s) to reach 168 pounds.

(Simplify your answer. Type an integer, proper fraction, or mixed number.)

(1) [ ] constant (2) [ ] lose

[ ] varying [ ] gain

ID: 3.5.7
19. Use the table to find the slope, \( m \), of the graph of \( Y_1 \).

Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The slope of the line is \( \frac{b}{a} \).
  
  (Type an integer or a simplified fraction.)
- **B.** The slope of the line is undefined.

| Table of Points Generated by Linear Function \( Y_1 \) |
|---|---|
| \( X \) | \( Y_1 \) |
| \(-4\) | \(-7\) |
| \(-3\) | \(-5\) |
| \(-2\) | \(-3\) |
| \(-1\) | \(-1\) |
| \(0\)  | \(1\)  |
| \(1\)  | \(3\)  |
| \(2\)  | \(5\)  |

ID: 3.5.8b

20. Find the rate of change.

The rate of change is \( \$ \) _______ per year.

(Type an integer or a decimal.)

ID: 3.5.9a
21. Each of the parts a through c refers to the graph that accompanies it. The graphed line in each grid represents the total distance a car travels as a function of time (in hours). Answer parts a through c.

a. How fast is the car traveling? Explain the result. Select the correct choice below and fill in the answer box to complete your choice. (Type an integer or decimal.)

☐ A. The car is traveling ________ miles per hour. It is the slope of the line.

☐ B. The car is traveling ________ miles per hour. It is the total distance traveled in 8 hours.

☐ C. The car is traveling ________ hours per mile. It is the slope of the line.

b. How can you determine visually from the following graph which car is going faster? Verify the answer by calculating the speed of each car. Select the correct choice below and fill in the answer boxes to complete your choice. (Round to the nearest tenth as needed.)

☐ A. Car A is going faster because the line for car A is steeper than the line for car B. This is verified because the speed of car A is ________ miles per hour which is greater than the speed of car B which is ________ miles per hour.

☐ B. Car B is going faster because the line for car B is steeper than the line for car A. This is verified because the speed of car B is ________ miles per hour which is greater than the speed of car A which is ________ miles per hour.

c. Describe in words the movement of the car that is represented by the following graph.

☐ A. The car moves with a speed of about 30 miles per hour for 2 hours, then halts for 1 hour and continues its journey with a speed of about 47 miles per hour for the next 3 hours.

☐ B. The speed of the car increases continuously for the first 2 hours, then the car moves with a constant speed for the next 1 hour and continues its journey with increasing speed for the next 3 hours.

☐ C. The car moves with a speed of about 47 miles per hour for 2 hours, then halts for 1 hour and continues its journey with a speed of about 30 miles per hour for the next 3 hours.

☐ D. The car moves with a speed of about 30 miles per hour for 2 hours, then halts for 1 hour and continues its journey with a speed of about 30 miles per hour for the next 3 hours.
22. Answer parts a and b based on the following graphs of lines.

a. Determine the slope of each of the following lines.

Slope =

Slope =

Slope =

b. At first glance, the three graphs in part a may appear to represent the same line. Do they?

- Yes
- No

ID: 3.5.11
Driving a rental car $x$ miles costs $C(x) = 0.47x + 42$ dollars. Complete parts a, b, and c below.

a. What is the slope of this model?

The slope is $\text{_________}$.  
(Type an integer or decimal rounded to two decimal places as needed.)

What does the slope represent in this situation? Choose the correct answer below.

- the cost per mile of driving the car
- the miles driven
- the total cost of renting and driving the car
- the fixed cost of driving the car

b. What is the y-intercept of this model?

The y-intercept is $\text{_________}$.  
(Type an integer or decimal rounded to two decimal places as needed.)

What does the y-intercept represent in this situation? Choose the correct answer below.

- the fixed cost of renting the car
- the miles driven
- the total cost of renting and driving the car
- the cost per mile of driving the car

c. How much does it cost to drive the car one additional mile?

Driving one additional mile would cost an additional $\text{_________}$.

ID: 3.6.3
The formula \( P(x) = -0.5x + 36 \) models the percentage of men, \( P(x) \), smoking cigarettes \( x \) years after 1980.

a. Use the formula to find the percentage of men who smoked in 1988.

The percentage of men who smoked in 1988 is \( \frac{\text{}}{\text{}} \)%.
(Simplify your answer. Type an integer or decimal rounded to one decimal place as needed.)

b. What is the slope of this model?

The slope is \( \frac{\text{}}{\text{}} \).
(Simplify your answer. Type an integer or decimal rounded to one decimal place as needed.)

What does the slope represent in this situation? Choose the correct answer below.

- The slope represents the men that smoke is (1) \( \frac{\text{}}{\text{}} \) by \( \frac{\text{}}{\text{}} \) (2) \( \frac{\text{}}{\text{}} \).

ID: 3.6.4

c. What is the \( P(x) \)-intercept of this model?

The \( P(x) \)-intercept is \( \frac{\text{}}{\text{}} \). (Type an integer or a fraction.)

What does the \( P(x) \)-intercept represent in this situation? Choose the correct answer below.

- In 1980, the percent increase if men who smoked.
- The percentage of men who smoked in 1980.
- The number of years after 1980 that the percentage of men who smoke will be 0%.
- The percentage of men who smoked one year after 1980.

(1) \( \frac{\text{}}{\text{}} \) increasing \( \frac{\text{}}{\text{}} \) % per year.
(2) \( \frac{\text{}}{\text{}} \) years.
\( \frac{\text{}}{\text{}} \) years per 1 %.

ID: 3.6.6a

25. Find the equation of the line whose slope is 4 and \( y \)-intercept is \( (0, -1) \). Graph the line.

The equation of the line is \( \frac{\text{}}{\text{}} \).
(Type your answer in slope-intercept form.)

Use the graphing tool to graph the equation.

ID: 3.6.6a
26. Find the equation of the line whose slope is $-8$ and y-intercept is $(0,0)$. Graph the line.

The equation of the line is _______________
(Type your answer in slope-intercept form.)

Use the graphing tool to graph the equation.

ID: 3.6.6b

27. Find the equation of the line with y-intercept $(0, -8)$ and slope of $\frac{2}{9}$.

Enter the equation of the line in slope-intercept form below.

______
(Type an equation. Use integers or fractions for any numbers in the equation.)

ID: 3.6.6c

28. Graph the function by using intercepts.

$g(x) = -4x - 5$

Use the graphing tool to graph the equation. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.

ID: 3.6.7
29. Use the intercepts to graph the line.

\[ f(x) = -3x + 6 \]

Use the graphing tool to graph the line. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.

ID: 3.6.8

30. Find the horizontal intercept and the vertical intercept. Then graph the equation.

\[ y = 8 \]

What is the horizontal intercept? Select the correct choice below and fill in any answer boxes within your choice.

- A. The horizontal intercept is \( \quad \) 
  (Type an ordered pair.)
- B. There is no horizontal intercept.

What is the vertical intercept? Select the correct choice below and fill in any answer boxes within your choice.

- A. The vertical intercept is \( \quad \) 
  (Type an ordered pair.)
- B. There is no vertical intercept.

Use the graphing tool to graph the line. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.

ID: 3.6.9
31. Find the intercepts and then use them to graph the equation.

\[ y = -\frac{5}{2}x + 5 \]

Use the graphing tool to graph the line. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.

ID: 3.6.10

32. Use intercepts and a checkpoint to graph the linear function below.

\[ 4x - y = 16 \]

Use the graphing tool to graph the linear equation. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.

ID: 3.6.11

33. Find the intercepts and then use them to graph the equation.

\[ 4x + 2y = 8 \]

Use the graphing tool to graph the line. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.

ID: 3.6.12
34. Graph the equation using the x- and y-intercepts.

\[ y = -2x + 7 \]

Use the graphing tool to graph the linear equation.

(Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.)

ID: 3.6.19a

35. Graph the linear equation.

\[ y = -\frac{8}{3}x + 4 \]

Use the graphing tool to graph the linear equation.

ID: 3.6.19b

36. Write the equation of the line in slope-intercept form given the vertical intercept and another point on the line.

(3, -2), (0, 4)

The equation of the line is \( y = \) \[ \text{expression} \].

(Type an expression using x as the variable. Use integers or fractions for any numbers in the expression.)

ID: 3.7.4
37. Suppose the imports from a certain country grew from about 37 billion dollars in 1994 to 67 billion dollars in 2000. Let \( x = 0 \) correspond to 1994.

Estimate the imports (in billions of dollars) for the year 2001. (Assume the data can be modeled by a straight line.)

Which linear equation best models the imports?

- **A.** \( y = 5x - 37 \)
- **B.** \( y = 3x - 37 \)
- **C.** \( y = 3x + 37 \)
- **D.** \( y = 5x + 37 \)

In 2001, the imports were approximately ____________ billion dollars.

ID: 3.7.5
Federal income tax paid by an individual single taxpayer is a function of taxable income. For a recent year, the federal tax for various taxable incomes is given in the following table. Complete parts a through f below.

<table>
<thead>
<tr>
<th>i, Taxable Income ($)</th>
<th>15,000</th>
<th>16,250</th>
<th>17,500</th>
<th>18,750</th>
<th>20,000</th>
<th>21,250</th>
<th>22,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>t, Federal Tax ($)</td>
<td>1,689</td>
<td>1,914</td>
<td>2,139</td>
<td>2,364</td>
<td>2,589</td>
<td>2,814</td>
<td>3,039</td>
</tr>
</tbody>
</table>

a. Plot the data points, with taxable income i as input and tax t as output. Scale the input axis from $0 to $24,000 and the output axis from $0 to $4000. Explain why the relationship is linear. Choose the correct graph below.

[Graphs A, B, C, D]

Why is the relationship linear?

A. All the points lie on a single line.
B. Not all of the points lie on a single line.
C. The best-fit line is a straight line.
D. Most of the points lie in a straight line.

b. Determine the slope of the line. What is the practical meaning of the slope?

The slope of the line is ____________.

(The type an integer or a decimal.)

The practical meaning of the slope of this line is (1) ____________

c. Write an equation to model this situation. Use the variable i to represent the taxable income and the variable t to represent the federal tax owed.

The equation is ____________.

(Type an equation. Type your answer in slope-intercept form. Use integers or decimals for any numbers in the equation.)

d. What is the t-intercept? Does it make sense? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The t-intercept is ____________. This t-intercept does not make any sense in this problem.

B. The t-intercept is ____________. This t-intercept does make sense in this problem.

e. Use the equation from part c to determine the federal tax owed by a college student having a taxable income of $8600.

The federal tax owed by a college student is $ ____________.

f. Use the equation from part c to determine the taxable income of a single person who paid $1686 in federal taxes.

The taxable income of a single person is $ ____________.

(Round to the nearest dollar as needed.)
39. Find the equation of the line that contains the given point and slope. Write the equation in slope-intercept form and graph the line.

\((1,1); \text{slope} = 5\)

The equation of the line is _______.
(Type your answer in slope-intercept form.)

Choose the correct graph of the line below.

- **A.**
- **B.**
- **C.**

ID: 3.8.2

40. Determine the equation of the line that has the given slope and passes through the given point. Then sketch a graph of the line.

\(m = -1, \text{ through the point } (5,0)\)

The equation of the line is _______.
(Type your answer in slope-intercept form.)

Use the graphing tool to graph the line. Use the given point when drawing the line.

ID: 3.8.3
41. Graph the line containing the point \( P \) and having slope \( m \).

\[ P = (3, -3); \, m = -1 \]

Use the graphing tool to graph the line. Use the given point when drawing the line.

ID: 3.8.5

42. Find the equation of the line that fits the description.

Passes through \((-1, -7)\) and has zero slope.

The equation of the line is \[ \underline{y = -7} \].
(Simplify your answer.)

ID: 3.8.6

43. Graph the line that contains the point \((-4, -1)\) and has a slope of \(\frac{1}{4}\).

Use the graphing tool to graph the line. Use the given point when drawing the line.

ID: 3.8.7

44. Find an equation of the line that has the given slope and passes through the given point.

\[ m = \frac{4}{3}, \, (3, -5) \]

\[ y = \underline{-5} \]

ID: 3.8.8
45. The annual cost of the average private college or university is shown in the table. This cost includes tuition, fees, room, and board.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>$25,000</td>
</tr>
<tr>
<td>2008</td>
<td>$29,000</td>
</tr>
</tbody>
</table>

(a) Find the slope-intercept form of a line that passes through these two data points.

The slope-intercept form of a line that passes through these two data points is \[ y = \frac{2000}{4} \times x + 25000 \].

(b) Interpret the slope as a rate of change.

Choose the correct choice below.

- B. The cost is increasing by $2000 per year.
- C. The cost is increasing by $2000 for period 2006 to 2008.
- D. The cost is decreasing by $2000 per year.

(c) Estimate the cost of private college in 2015.

The cost of private college in 2015 is $ \[ 27000 \].

ID: 3.8.15

46. The median home sale price in country A has been rising approximately linearly since 1995. The median home sale price in 1995 was $130,500. The median home sale price in 2004 was $209,700. Let \( P \) be the median home sale price and let \( t \) be the number of years since 1995.

a. Determine a function \( P(t) \) that fits this data.

\[ P(t) = \frac{209700 - 130500}{2004 - 1995} \times (t - 1995) + 130500 \]

b. Use the function from part (a) to estimate the median home sale price in 2000.

\[ P(5) = \frac{209700 - 130500}{2004 - 1995} \times (5 - 1995) + 130500 \]

ID: 3.8.16

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

\[ (-3,0) \text{ and } (0,1) \]

What is the equation of the line?

\[ y = \frac{1}{3}x + 1 \]

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

ID: 3.HCIP2.8a

48. Find the slope-intercept equation of the line that has the given characteristics.

Slope 7 and the line passes through the point (0,9)

What is the slope-intercept equation?

\[ y = 7x + 9 \]

ID: 3.HCIP2.8b
49. Find the equation of the line that fits the description.

Passes through \((1, -3)\) and has zero slope.

The equation of the line is ____________.
(Simplify your answer.)

ID: 3.HCIP2.8c

50. Complete the table for each equation. Then identify the solution to both equations.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(y = x + 2)</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>(y = 4 - x)</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

The solution to both equations is ____________. (Type an ordered pair.)

ID: 3.11.1d

51. Solve the system of equations graphically.

\[
\begin{align*}
x &= -y + 8 \\
x &= y
\end{align*}
\]

Use the graphing tool to graph the system.

What is the solution of the system of equations? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution is ____________.
  (Type an ordered pair.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

ID: 3.11.1h

52. A woman is considering two companies from which to rent a truck. Triangle Truck Rental charges $35 per day and 45 cents a mile. Circle Rent-A-Truck charges $60 a day and 25 cents a mile. How far would she need to drive in one day for the both companies to have the same total cost?

How many miles would she need to drive in the day?

__________ miles

ID: 3.11.1i
53. Ellie is considering joining a health club during the winter months. One club charges $15.00 per month and $4 per visit and a second club charges $5.50 per visit with no monthly membership fee. At how many visits will the monthly price of the two clubs be the same?

At ____________ visits the monthly price of the two clubs will be the same.

ID: 3.11.3

54. A golfer has two options for membership in a golf club. A social membership costs $1775 in annual dues. In addition, he would pay a $25 greens fee and a $25 golf cart fee every time he played. A golf membership costs $2425 in annual dues. With this membership, the golfer would only pay a $25 golf cart fee when he played. How many times per year would the golfer need to play golf for the two options to cost the same?

The golfer would need to golf ____________ times per year for the two options to cost the same.

ID: 3.11.5

55. Solve the system of equations by substitution.

\[ y = 24 - 3x \]
\[ y = 3x \]

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

- **A.** The system is consistent, and the solution is ____________. (Type an ordered pair.)
- **B.** The system is inconsistent.

ID: 3.11.6

56. Solve the system of equations by the substitution method.

\[ y = 2x - 5 \]
\[ y = 9x - 4 \]

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

- **A.** The system is consistent, and the solution is ____________. (Type an ordered pair.)
- **B.** The system is inconsistent.

ID: 3.11.7

57. Solve the following system by substitution.

\[ x = 12y + 63 \]
\[ x = \frac{6}{5}y \]

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

- **A.** The system is consistent, and the solution is ____________. (Type an ordered pair.)
- **B.** The system is inconsistent.

ID: 3.11.8
58. Use substitution to determine algebraically the exact solution to the system of equations. Check the solutions numerically and by using the table feature or graphing capability of a graphing calculator or other form of technology.

\[
\begin{align*}
  z &= 2w - 4 \\
  z &= -2w - 4
\end{align*}
\]

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

- **A.** The system is consistent, and the solution is ___________.
  (Type an ordered pair.)
- **B.** The system is inconsistent.

ID: 3.11.9
59. John wants to hire someone to prune his trees and shrubs. One service he called charges an $11$ consultation fee plus $9$ an hour for the actual work. A neighborhood gardener said that she does not include a consulting fee, but she charges $12$ an hour for her work. Complete parts a through e below.

a) Write an equation that describes the pruning service's charge, $C$, as a function of $h$, the number of hours worked.

$b) Write an equation that describes the local gardener's charge, $C$, as a function of $h$, the number of hours worked.$

$c) Whom would he hire for a 4-hour job?$

○ the local gardener
○ the other service

d) When, if at all, would it be more economical to hire the other service? Set up and solve a system of equations to answer this question. Select the correct choice below and fill in the answer boxes to complete your choice.

(Type an integer, fraction, or mixed number.)

○ A. If John gets a service which charges greater than $\$ \quad$ for $\quad$ hours

then it would me more economical to go for other service.

○ B. If John finds a service which charges less than $\$ \quad$ for $\quad$ hours,

then it would be more economical to use the other service.

e) Use technology to verify the results. Choose the correct graph below.

○ A. 

○ B. 

○ C. 

○ D. 

(All graphs have the viewing window $[0, 10, 1] \quad [0, 100, 10].$)

ID: 3.11.10

60. Solve the system by the substitution method.

\[ y = -5x + 8 \]
\[ 5x - 3y = -4 \]

The solution to the system is \quad .

(Simplify your answer. Type an ordered pair.)

ID: 3.12.1b
61. Find the solution to the system by the substitution method. Check your answer.

\[
\begin{align*}
8x + y &= 14 \\
4x + 5y &= -20 \\
\end{align*}
\]

The solution to the system is ___________.
(Simplify your answer. Type an ordered pair. Type integers or decimals rounded to the nearest tenth as needed.)

ID: 3.12.1d

62. Solve the system by the addition method.

\[
\begin{align*}
3x + 12y &= 6 \\
4x - 12y &= 8 \\
\end{align*}
\]

The solution to the system is ___________.
(Simplify your answer. Type an ordered pair.)

ID: 3.12.2a

63. Solve the system by the addition method. Check the answer numerically and by using a graphing calculator.

\[
\begin{align*}
2x - 3y &= 5 \\
5x + 5y &= -25 \\
\end{align*}
\]

The solution to the system is ___________.
(Simplify your answer. Type an ordered pair.)

ID: 3.12.2b

64. Solve the system by the addition method. Check the answer numerically and by using a graphing calculator.

\[
\begin{align*}
7x - 5y &= 1 \\
5x + y &= -\frac{1}{5} \\
\end{align*}
\]

The solution to the system is ___________.
(Simplify your answer. Type an ordered pair. Type integers or decimals rounded to the nearest tenth as needed.)

ID: 3.12.2c

65. In a discount clothing store, all sweaters are sold at one fixed price and all shirts are sold at another fixed price. If one sweater and two shirts cost $42, while five sweaters and five shirts cost $155, find the price of one sweater and the price of one shirt.

The price of a sweater is $ ___________.

The price of a shirt is $ ___________.

ID: 3.12.4e
66. As part of a community service project, a fraternity is asked to put up a fence in the playground area at a local daycare facility. A local fencing company will donate 900 feet of fencing. The daycare center director specifies that the length of the rectangular enclosure be 120 feet more than the width. Determine the dimensions of the enclosed region that meets the director's specifications. Complete the parts a) through e).

a) What does the 900 represent with respect to the rectangular enclosure?

- Area of the rectangular enclosure
- Perimeter of the rectangular enclosure

b) Write an equation that gives the relationship between the length \( L \), width \( W \), and 900.

(Do not simplify.)

c) Write an equation that expresses the length of the rectangle in terms of \( W \).

d) The equations in parts b) and c) form a system of equations involving the variables \( L \) and \( W \). Solve this system of equations to determine the dimensions of the enclosed region that satisfy the given conditions.

The length of the rectangular enclosure is __________ feet and the width is __________ feet.

e) Explain how you know that your result in part d) solves the problem statement.

- A. The values check when they are verified in any one of the original equations.
- B. The values check when they are verified in both of the original equations.
- C. The values can be used to find the area of the rectangular enclosure.
- D. Solving the system by addition gives the same result as solving it by substitution.

ID: 3.12.5

67. Solve the following inequality algebraically.

\[ 5x > -30 \]

The solution is __________.

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

ID: 3.14.4

68. Solve the following inequality algebraically.

\[ 4 - 8x > -6 \]

The solution is __________.

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

ID: 3.14.5
69. Solve the following inequality algebraically.

\[ 8x - 3 > 6x + 3 \]

The solution is ________.
(Simplify your answer. Type an inequality. Use integers or fractions for any numbers in the expression.)

ID: 3.14.7

70. Solve \( 3 - x < 2(x - 3) + 3 \) algebraically.

The solution is ________.
(Simplify your answer. Type an inequality. Use integers or fractions for any numbers in the expression.)

ID: 3.14.9

71. Solve the system of equations by the substitution method.

\[
\begin{align*}
y &= 2x - 9 \\
y &= 7x - 10
\end{align*}
\]

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

- **A.** The solution is ________.
  (Type an ordered pair.)
- **B.** There is no solution.

ID: 3.HCIP3.3

72. You sell centerpieces for $40.50 each. Your fixed costs are $540 per month, and each centerpiece costs $18 to produce. (In solving this exercise, let \( n \) represent the number of centerpieces produced and sold.) Complete parts a through c below.

a. Write the cost function.

\[ C(n) = \] ________

b. Write the revenue function.

\[ R(n) = \] ________

c. Determine the break-even point.

Thus, ________ centerpieces must be sold to break even.

ID: 3.HCIP3.4

73. An automobile dealership has found that for every 180 cars sold, 23 will be brought back to the dealer for major repairs. If the dealership sells 1080 cars this year, approximately how many cars will be brought back for major repairs?

_______ cars

ID: 1.11.3
74. The distance between two cities is approximately 3804 kilometers. What is the distance between these two cities in miles? A kilometer is equivalent to 0.6214 miles.

The distance is ____________ miles.
(Round to the nearest whole number as needed.)

ID: 1.11.6

75. Nurses who administer medications must ensure that each dosage is customized to the patient. Units of measurement in the following dosage problem are g, grams and mg, milligrams. Determine how many tablets need to be administered.

The dose to be given is 630 milligrams. The stock strength is 0.21 gram per tablet.

The number of tablets that need to be administered is ____________.

ID: 1.11.15a
1. A. The independent variable is weight and the dependent variable is height.
   
   C. No, because there is a value in the weight column for which there are two different values assigned in the height column.
   
   A. The independent variable is height and the dependent variable is weight.
   
   B. Yes, because for each value in the height column, there is one and only one value assigned in the weight column.
   
   D. No, because there can be persons with the same height and different weights.

2. Yes

3. No

4. Yes
   
   D. {John, Katie, Kia, Marsha, Jan}
   
   B. {Doe, Smith, Hill, Brady}

5. No
   
   {Z, A, C}
   
   {Y, B, D}

6. − 4
   
   6
   
   4
   
   − 6

7. 250


9. A. It means the median age of a man at the time of his first marriage decreases during the ten-year period.
   
   
   (1) go down.

10. – 2100

11. 3

12. Yes
13. D. \( \left( \frac{1}{2}, \frac{2}{9} \right) \), E. \( -5, -\frac{5}{27} \)

14. \( 500 + 0.20x \)
   
   1,700
   
   3,000

15. 40

16. 12

17. 144

18. 182
   
   180
   
   178
   
   176
   
   174

B.

(1) constant
   
   - 2

(2) lose
   
   2
   
   7

19. A. The slope of the line is \( \frac{2}{\ _\ } \). (Type an integer or a simplified fraction.)

20. -300
21. A. The car is traveling 50 miles per hour. It is the slope of the line.

B. Car B is going faster because the line for car B is steeper than the line for car A. This is verified because the speed of car B is 68.6 miles per hour which is greater than the speed of car A which is 46.7 miles per hour.

A. The car moves with a speed of about 30 miles per hour for 2 hours, then halts for 1 hour and continues its journey with a speed of about 47 miles per hour for the next 3 hours.

22. 2
   3
   4
   No

23. 0.47
   the cost per mile of driving the car
   42
   the fixed cost of renting the car
   0.47

24. 32
   – 0.5
   (1) decreasing
   0.5
   (2) % per year.
   36
   The percentage of men who smoked in 1980.

25. $y = 4x - 1$
26. \( y = -8x \)

27. \( y = \frac{2}{9}x - 8 \)

28. \( y = \frac{2}{9}x - 8 \)

29. \( y = \frac{2}{9}x - 8 \)
30. B. There is no horizontal intercept.

A. The vertical intercept is (0,8). (Type an ordered pair.)

31.

32.
33. 

34. 

35. 

36. $-2x + 4$

37. D. $y = 5x + 37$
38. D.

A. All the points lie on a single line.

0.18

(1) a line rising to the right.

t = 0.18i − 1011

A. The t-intercept is (0, -1011). This t-intercept does not make any sense in this problem. (Type an ordered pair.)

537

14983

39. y = 5x − 4

A.

40. y = −x + 5
41.

42. $y = -7$

43.

44. $\frac{4}{3}x - 9$

45. $y = 2000x - 3,987,000$
   
   B. The cost is increasing by $2000 per year.

46. $8800t + 130,500$

47. $\frac{1}{3}x + 1$

48. $7x + 9$
49. \( y = -3 \)

50. 2
3
4
5
4
3
2
1
(1,3)

51. A. The solution is \( (4,4) \). (Type an ordered pair.)

52. 125

53. 10

54. 26

55. A. The system is consistent, and the solution is \( (4,12) \). (Type an ordered pair.)

56. A. The system is consistent, and the solution is \( \left( -\frac{1}{7}, -\frac{37}{7} \right) \). (Type an ordered pair.)

57. A. The system is consistent, and the solution is \( \left( -7, -\frac{35}{6} \right) \). (Type an ordered pair.)
58. A. The system is consistent, and the solution is \((0, -4)\). (Type an ordered pair.)

59. \(C = 9h + 11\)

\[ C = 12h \]

the other service

B.

If John finds a service which charges less than $44 for \(3 \frac{2}{3}\) hours, then it would be more economical to use the other service.

![Graph]

60. (1,3)

61. (2.5, -6)

62. (2,0)

63. (-2, -3)

64. (0, -0.2)

65. 20

66. Perimeter of the rectangular enclosure

\[ 2(L + W) = 900 \]

\[ L = W + 120 \]

285

165

B. The values check when they are verified in both of the original equations.

67. \(x > -6\)
68. \( x < \frac{5}{4} \)

69. \( x > 3 \)

70. \( x > 2 \)

71. A. The solution is \( \left( \frac{1}{5}, -\frac{43}{5} \right) \). (Type an ordered pair.)

72. \( 540 + 18n \)
   40.5n
   24

73. 138

74. 2364

75. 3