Algebra 1 Chapter 05 Review

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

Find the slope of the line that passes through the pair of points.

_____ 1. (1, 7), (10, 1)
   a. \( \frac{3}{2} \)      b. \( \frac{2}{3} \)      c. \( \frac{3}{2} \)      d. \( \frac{2}{3} \)

_____ 2. A student finds the slope of the line between (14, 1) and (18, 17). She writes \( \frac{1-17}{18-14} \). What mistake did she make?
   a. She should have added the values, not subtracted them.
   b. She used \( y \)-values where she should have used \( x \)-values.
   c. She mixed up the \( x \)- and \( y \)-values.
   d. She did not keep the order of the points the same in the numerator and the denominator.

_____ 3. Use the graph.
   a. Which plant was the tallest at the beginning?
   b. Which plant had the greatest rate of change over the 6 weeks?

   a. plant 2; plant 2      c. plant 3; plant 1
   b. plant 1; plant 3      d. plant 3; plant 3

Write an equation of a line with the given slope and \( y \)-intercept.

_____ 4. \( m = 1, b = 4 \)
   a. \( y = 4x + 1 \)      c. \( y = -1x + 4 \)
   b. \( y = x - 4 \)      d. \( y = x + 4 \)
Write the slope-intercept form of the equation for the line.

5. \[ y = \frac{10}{3}x + \frac{1}{2} \]  
   a. \[ y = 3x - 1 \]  
   b. \[ y = -3x - 1 \]  
   c. \[ y = \frac{1}{3}x + 1 \]  
   d. \[ y = \frac{1}{3}x - 1 \]

6. \[ y = \frac{3}{10}x + \frac{1}{2} \]  
   a. \[ y = -\frac{10}{3}x + \frac{1}{2} \]  
   b. \[ y = \frac{3}{10}x + \frac{1}{2} \]  
   c. \[ y = \frac{3}{10}x + \frac{1}{2} \]  
   d. \[ y = \frac{1}{2}x + \frac{3}{10} \]

7. Write an equation of a line that has the same slope as \(2x - 5y = 12\) and the same \(y\)-intercept as \(4y + 24 = 5x\).
   a. \[ y = \frac{2}{5}x - 6 \]  
   b. \[ y = 6x - \frac{2}{5} \]  
   c. \[ y = \frac{5}{2}x - 6 \]  
   d. \[ y = \frac{1}{6}x - \frac{5}{2} \]
Graph the equation.

8. \( x = -4 \)
   a. 
   b. 
   c. 
   d.
9. \(y + 2 = -(x - 4)\)

a. 

b. 

c. 

d. 

10. \( y - 3 = -(x + 5) \)
   - a.
   - b.
   - c.
   - d.

11. \((4, -6); m = \frac{3}{5}\)
   - a. \( y + 6 = \frac{3}{5}x - 4 \)
   - b. \( y - 6 = \frac{3}{5}(x + 4) \)
   - c. \( y + 6 = \frac{3}{5}(x - 4) \)
   - d. \( y - 4 = \frac{3}{5}(x + 6) \)

12. \((10, -9); m = -2\)
   - a. \( y - 10 = -2(x + 9) \)
   - b. \( y - 9 = -2(x + 10) \)
   - c. \( y - 9 = -2(x - 10) \)
   - d. \( y + 9 = -2(x - 10) \)
Are the graphs of the lines in the pair parallel? Explain.

_____ 13. $y = \frac{1}{6}x + 8$

$-2x + 12y = -11$

a. Yes, since the slopes are the same and the $y$-intercepts are the same.
b. No, since the $y$-intercepts are different.
c. Yes, since the slopes are the same and the $y$-intercepts are different.
d. No, since the slopes are different.

_____ 14. The map shows Hope Road and the construction site for the new library. Find the equation of a “street” that passes through the building site and is parallel to Hope Road.

![Map showing Hope Road and a construction site](image)

a. $y = 3x + 4$

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

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

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

Write an equation for the line that is parallel to the given line and that passes through the given point.

_____ 15. $y = -5x + 3; (-6, 3)$

a. $y = -5x + 27$

c. $y = 5x - 9$

b. $y = -5x - 27$

d. $y = -5x + 9$

Tell whether the lines for each pair of equations are parallel, perpendicular, or neither.

_____ 16. $7x - 4y = 4$

$x - 4y = 3$

a. perpendicular  b. parallel  c. neither
Write the equation of a line that is perpendicular to the given line and that passes through the given point.

17. \(4x - 12y = 2; (10, -1)\)
   a. \(y = 3x + 29\)
   b. \(y = -\frac{1}{3}x + 29\)
   c. \(y = -3x + 29\)
   d. \(y = \frac{1}{3}x + 7\)

18. \(y = \frac{2}{3}x + 9; (-6, 5)\)
   a. \(y = -\frac{2}{3}x + 1\)
   b. \(y = -\frac{3}{2}x + \frac{3}{2}\)
   c. \(y = \frac{2}{3}x + 9\)
   d. \(y = -\frac{3}{2}x - 4\)

Short Answer

19. Suppose you have $20.00 to buy cold cuts for a class picnic. Ham costs $3.99 per pound and turkey costs $4.99 per pound. The equation \(3.99x + 4.99y = 20\) models this situation. What does the \(x\)-intercept of the graph of the equation tell you about the amount of meat you can buy?

Essay

20. Write \(y = \frac{5}{3}x - 11\) in standard form. Show your work. Justify each step.

21. Use the map to answer the following. Show your work.

   a. What is the slope of the line representing Elm Street?
   b. Show that Birch Street and Poplar Avenue are parallel.
   c. Show that Fir Street is NOT perpendicular to Birch Street.
Algebra 1 Chapter 05 Review  
Answer Section

MULTIPLE CHOICE

1. **ANS:** B  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-1 Rate of Change and Slope  
**OBJ:** 5-1.2 Finding Slope  
**TOP:** 5-1 Example 4  
**STA:** CA A1 6.0 | CA A1 7.0 | CA A1 8.0  
**KEY:** finding slope using points | slope

2. **ANS:** D  
**PTS:** 1  
**DIF:** L3  
**REF:** 5-1 Rate of Change and Slope  
**OBJ:** 5-1.2 Finding Slope  
**TOP:** 5-1 Example 4  
**STA:** CA A1 6.0 | CA A1 7.0 | CA A1 8.0  
**KEY:** slope | reasoning | error analysis

3. **ANS:** A  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-2 Slope-Intercept Form  
**OBJ:** 5-1.1 Finding Rates of Change  
**TOP:** 5-1 Example 2  
**STA:** CA A1 6.0 | CA A1 7.0 | CA A1 8.0  
**KEY:** graphing | rate of change | problem solving | word problem | multi-part question

4. **ANS:** D  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-2 Slope-Intercept Form  
**OBJ:** 5-2.1 Writing Linear Equations  
**TOP:** 5-2 Example 2  
**STA:** CA A1 6.0 | CA A1 7.0  
**KEY:** linear equation | slope | y-intercept

5. **ANS:** A  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-2 Slope-Intercept Form  
**OBJ:** 5-2.1 Writing Linear Equations  
**TOP:** 5-2 Example 3  
**STA:** CA A1 6.0 | CA A1 7.0  
**KEY:** graphing | slope | y-intercept | slope-intercept form | finding slope using a graph

6. **ANS:** C  
**PTS:** 1  
**DIF:** L3  
**REF:** 5-2 Slope-Intercept Form  
**OBJ:** 5-2.1 Writing Linear Equations  
**TOP:** 5-2 Example 3  
**STA:** CA A1 6.0 | CA A1 7.0  
**KEY:** graphing | slope | y-intercept | slope-intercept form | finding slope using a graph

7. **ANS:** A  
**PTS:** 1  
**DIF:** L4  
**REF:** 5-3 Standard Form  
**OBJ:** 5-3.2 Writing Equations in Standard Form  
**TOP:** 5-3 Example 3  
**STA:** CA A1 6.0  
**KEY:** standard form of a linear equation

8. **ANS:** B  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-3 Standard Form  
**OBJ:** 5-3.1 Graphing Equations Using Intercepts  
**TOP:** 5-3 Example 3  
**STA:** CA A1 6.0  
**KEY:** graphing | horizontal and vertical lines

9. **ANS:** B  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-4 Point-Slope Form and Writing Linear Equations  
**OBJ:** 5-4.1 Using Point-Slope Form  
**STA:** CA A1 6.0 | CA A1 7.0  
**TOP:** 5-4 Example 1  
**KEY:** point-slope form | graphing | linear equation

10. **ANS:** A  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-4 Point-Slope Form and Writing Linear Equations  
**OBJ:** 5-4.1 Using Point-Slope Form  
**STA:** CA A1 6.0 | CA A1 7.0  
**TOP:** 5-4 Example 1  
**KEY:** point-slope form | graphing | linear equation

11. **ANS:** C  
**PTS:** 1  
**DIF:** L2  
**REF:** 5-4 Point-Slope Form and Writing Linear Equations  
**OBJ:** 5-4.1 Using Point-Slope Form  
**STA:** CA A1 6.0 | CA A1 7.0  
**TOP:** 5-4 Example 2  
**KEY:** slope-intercept form | linear equation
12. **ANS: D**  
**PTS: 1**  
**DIF: L2**  
**REF: 5-4 Point-Slope Form and Writing Linear Equations**  
OBJ: 5-4.1 Using Point-Slope Form  
STA: CA A1 6.0 | CA A1 7.0  
TOP: 5-4 Example 2  
KEY: slope-intercept form | linear equation

13. **ANS: C**  
**PTS: 1**  
**DIF: L2**  
**REF: 5-5 Parallel and Perpendicular Lines**  
OBJ: 5-5.1 Parallel Lines  
STA: CA A1 7.0 | CA A1 8.0  
TOP: 5-5 Example 1  
KEY: parallel lines | slope

14. **ANS: D**  
**PTS: 1**  
**DIF: L3**  
**REF: 5-5 Parallel and Perpendicular Lines**  
OBJ: 5-5.1 Parallel Lines  
STA: CA A1 7.0 | CA A1 8.0  
TOP: 5-5 Example 2  
KEY: parallel lines | problem solving | word problem

15. **ANS: B**  
**PTS: 1**  
**DIF: L2**  
**REF: 5-5 Parallel and Perpendicular Lines**  
OBJ: 5-5.1 Parallel Lines  
STA: CA A1 7.0 | CA A1 8.0  
TOP: 5-5 Example 2  
KEY: parallel lines | linear equation

16. **ANS: C**  
**PTS: 1**  
**DIF: L3**  
**REF: 5-5 Parallel and Perpendicular Lines**  
OBJ: 5-5.2 Perpendicular Lines  
STA: CA A1 7.0 | CA A1 8.0  
TOP: 5-5 Example 3  
KEY: perpendicular lines | parallel lines

17. **ANS: C**  
**PTS: 1**  
**DIF: L2**  
**REF: 5-5 Parallel and Perpendicular Lines**  
OBJ: 5-5.2 Perpendicular Lines  
STA: CA A1 7.0 | CA A1 8.0  
TOP: 5-5 Example 3  
KEY: perpendicular lines | linear equation

18. **ANS: D**  
**PTS: 1**  
**DIF: L2**  
**REF: 5-5 Parallel and Perpendicular Lines**  
OBJ: 5-5.2 Perpendicular Lines  
STA: CA A1 7.0 | CA A1 8.0  
TOP: 5-5 Example 3  
KEY: perpendicular lines | linear equation

**SHORT ANSWER**

19. **ANS:**  
The x-intercept tell you the amount of ham you can buy if you do not buy any turkey.

**PTS: 1**  
**DIF: L3**  
**REF: 5-3 Standard Form**  
OBJ: 5-3.1 Graphing Equations Using Intercepts  
STA: CA A1 6.0  
KEY: standard form of a linear equation | x-intercept | y-intercept | problem solving | word problem
ESSAY

20. ANS:  

\[ y = \frac{5}{3} x - 11 \]

\[ 3y = 3 \left( \frac{5}{3} x - 11 \right) \text{ Multiply each side by 3.} \]

\[ 3y = 5x - 33 \text{ Use the Distributive Property.} \]

\[-5x + 3y = -33 \text{ Subtract 5x from each side.} \]

[3] correct steps with no justification OR one computational error  
[2] more than one computational error  
[1] more than one computational error and no justification

PTS: 1  
DIF: L3  
REF: 5-3 Standard Form  
OBJ: 5-3.2 Writing Equations in Standard Form  
STA: CA A1 6.0  
TOP: 5-3 Example 4  
KEY: essay | transforming equations | rubric-based question | extended response

21. ANS:  

[a]  
Elm: (4,1), (8, 8); \( m = \frac{8 - 1}{8 - 4} = \frac{7}{4} \)

[b]  
Birch: (10, 7), (1, 7); \( m = \frac{7 - 7}{10 - 1} = \frac{0}{9} = 0 \)

Poplar: (10, 3), (1, 3); \( m = \frac{3 - 3}{10 - 1} = \frac{0}{9} = 0 \)

Birch Street and Poplar Avenue both have a slope of 0, so they are parallel.

[c]  
Fir: (5, 10), (2, 2); \( m = \frac{10 - 2}{5 - 2} = \frac{8}{3} \)

Birch has a slope of 0, so it is horizontal. To be perpendicular, Fir would have to be vertical, but it has a slope of \( \frac{8}{3} \) so it is not perpendicular to Birch.

[3] two parts correct  
[2] one part correct with computational errors in the other parts OR missing explanations  
[1] more than two computational errors OR one computation error and missing explanations

PTS: 1  
DIF: L3  
REF: 5-5 Parallel and Perpendicular Lines

OBJ: 5-5.2 Perpendicular Lines  
STA: CA A1 7.0 | CA A1 8.0

TOP: 5-5 Example 4  
KEY: parallel lines | perpendicular lines | graphing | problem solving | word problem | extended response | rubric-based question