Algebra 1 Chapter 06 Review

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

_____ 1. Solve the following system of equations by graphing.
   \[-4x + 3y = -12\]
   \[-2x + 3y = -18\]
   a. b. c. d.
   ![Graph A](image1)
   ![Graph B](image2)
   ![Graph C](image3)
   ![Graph D](image4)

_____ 2. What is the solution of the system of equations?
   \[y = 3x + 7\]
   \[y = x - 9\]
   a. \((-1, -10)\)  b. \((-17, -8)\)  c. \((4, 19)\)  d. \((-8, -17)\)
Graph each system. Tell whether the system has no solution, one solution, or infinitely many solutions.

3. \[ y = 5x - 4 \\
    y = 5x - 5 \]
   a. no solutions
   b. one solution
   c. infinitely many solutions

4. \[ y = 2x - 3 \\
    y = -x + 3 \]
   a. one solution
   b. no solutions
   c. infinitely many solutions

5. The length of a rectangle is 3 centimeters more than 3 times the width. If the perimeter of the rectangle is 46 centimeters, find the dimensions of the rectangle.
   a. length = 5 cm; width = 18 cm
   b. length = 13 cm; width = 5 cm
   c. length = 13 cm; width = 8 cm
   d. length = 18 cm; width = 5 cm

Solve the system of equations using substitution.

6. \[ y = 2x + 3 \\
    y = 3x + 1 \]
   a. \((-2, -1)\)
   b. \((-1, -2)\)
   c. \((2, 7)\)
   d. \((-2, -5)\)

7. \[ 3y = -\frac{1}{2}x + 2 \\
    y = -x + 9 \]
   a. \((3, 6)\)
   b. \((20, -4)\)
   c. \((10, -1)\)
   d. \((-1, 8)\)

8. \[ y = 4x + 6 \\
    y = 2x \]
   a. \((-3, -6)\)
   b. \((3, 6)\)
   c. \((6, 3)\)
   d. \((1, 2)\)

Solve the system using elimination.

9. \[ -10x - 3y = -18 \\
    -7x - 8y = 11 \]
   a. \((-7, -10)\)
   b. \((-4, 3)\)
   c. \((3, -4)\)
   d. \((2, -1)\)

10. \[ 3x - y = 28 \\
    3x + y = 14 \]
   a. \((8, -4)\)
   b. \((-7, 7)\)
   c. \((7, -7)\)
   d. \((-4, 8)\)

11. A jar containing only nickels and dimes contains a total of 60 coins. The value of all the coins in the jar is $4.45. Solve by elimination to find the number of nickels and dimes that are in the jar.
   a. 30 nickels and 30 dimes
   b. 31 nickels and 29 dimes
   c. 29 nickels and 31 dimes
   d. 28 nickels and 32 dimes
12. An ice skating arena charges an admission fee for each child plus a rental fee for each pair of ice skates. John paid the admission fees for his six nephews and rented five pairs of ice skates. He was charged $32.00. Juanita paid the admission fees for her seven grandchildren and rented five pairs of ice skates. She was charged $35.25. What is the admission fee? What is the rental fee for a pair of skates?

a. admission fee: $3.25
   skate rental fee: $2.50
b. admission fee: $3.50
   skate rental fee: $3.00
c. admission fee: $3.00
   skate rental fee: $2.00
d. admission fee: $4.00
   skate rental fee: $3.50

Graph the inequality.

13. \( y \geq 2x - 2 \)

a. 

\[ y \geq 2x - 2 \]

b. 

c. 

d. 

[Graphs are shown as options a, b, c, and d.]
Write the linear inequality shown in the graph.

____ 14.

- a. $y \leq 3x + 4$
- b. $y \leq 3x - 4$
- c. $y \geq 3x - 4$
- d. $y \geq 3x + 4$

____ 15.

- a. $x > -3$
- b. $x \geq -3$
- c. $y > -3$
- d. $y \geq -3$
Find a solution of the system of linear inequalities.

16. \[ a. \quad y > 4x - 3 \quad \quad b. \quad y \leq 4x + 3 \quad \quad c. \quad y < 4x - 3 \quad \quad d. \quad y \geq 4x + 3 \]

17. \[ 1.4x + 7y \geq 21 \]
\[ 10x - 2y \geq 16 \]
\[ a. \quad (4, 1) \quad \quad b. \quad (2, 2) \quad \quad c. \quad (1, 2) \quad \quad d. \quad (5, 2) \]
Solve the system of linear inequalities by graphing.

18. \[ y \leq x + 4 \]
\[ 2x + y \leq -4 \]

a. 

b. 

c. 

d.
Write a system of inequalities for the graph.

19.

a. \( y \geq x - 2 \)  
   \( y \geq -3x - 6 \)

b. \( y \leq x + 3 \)  
   \( y \geq 2x - 6 \)

c. \( y \leq x - 2 \)  
   \( y \leq -3x - 6 \)

d. \( y \geq x + 3 \)  
   \( y \leq 2x - 6 \)
Short Answer

20. Graph the following linear inequalities on the same coordinate plane. What figure does the solution to all three inequalities make?

\[
\begin{align*}
y & \geq -5 \\
y & \leq 2x + 5 \\
y & \leq -2x + 5 
\end{align*}
\]

Essay

21. A motorboat can go 16 miles downstream on a river in 20 minutes. It takes 30 minutes for this boat to go back upstream the same 16 miles.
Let \(x\) = the speed of the boat.
Let \(y\) = the speed of the current.
\[\text{a. Write an equation for the motion of the motorboat downstream.}\]
\[\text{b. Write an equation for the motion of the motorboat upstream.}\]
\[\text{c. Find the speed of the current.}\]
22. Niki has 8 coins worth $1.40. Some of the coins are nickels and some are quarters.
   a. Let \( q \) = the number of quarters and \( n \) = the number of nickels. Write an equation
      relating the number of quarters and nickels to the total number of coins.
   b. Write an equation relating the value of the quarters and the value of the nickels to
      the total value of the coins.
   c. How many of each coin does Niki have?

23. Amy’s restaurant has budgeted at most $60 to spend this month on gourmet coffee. All international
    blends cost $8.50 per package and all house blends cost $6.00 per package. She would like to purchase
    some international blends and at least 3 packages of the house blends. How can Amy spend $60 on \( x \)
    international blends and \( y \) house blends?
   a. Write a system of linear inequalities that describes this situation.
   b. Graph the system.
   c. Give a possible solution and describe what it means.
## Algebra 1 Chapter 06 Review
### Answer Section

### MULTIPLE CHOICE

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10. ANS: C   PTS: 1   DIF: L2
    REF:  6-3 Solving Systems Using Elimination
    OBJ:  6-3.1 Adding or Subtracting to Solve Systems   STA: CA A1 9.0
    TOP:  6-3 Example 1
    KEY: system of linear equations | elimination method | adding or subtracting equations

11. ANS: B   PTS: 1   DIF: L2
    REF:  6-3 Solving Systems Using Elimination
    OBJ:  6-3.2 Multiplying First to Solve Systems   STA: CA A1 9.0
    TOP:  6-3 Example 4
    KEY: word problem | problem solving | system of linear equations | elimination method | adding or subtracting equations

12. ANS: A   PTS: 1   DIF: L3
    REF:  6-4 Applications of Linear Systems
    OBJ:  6-4.1 Writing Systems of Linear Equations   STA: CA A1 9.0 | CA A1 15.0
    KEY: word problem | problem solving | system of linear equations | graphing a system of linear equations | substitution method | elimination method

13. ANS: B   PTS: 1   DIF: L2
    REF:  6-5 Linear Inequalities
    OBJ:  6-5.1 Graphing Linear Inequalities   STA: CA A1 6.0
    TOP:  6-5 Example 1
    KEY: linear inequality | graphing

14. ANS: C   PTS: 1   DIF: L2
    REF:  6-5 Linear Inequalities
    OBJ:  6-5.1 Graphing Linear Inequalities   STA: CA A1 6.0
    TOP:  6-5 Example 1
    KEY: linear inequality | graphing

15. ANS: C   PTS: 1   DIF: L2
    REF:  6-5 Linear Inequalities
    OBJ:  6-5.1 Graphing Linear Inequalities   STA: CA A1 6.0
    TOP:  6-5 Example 1
    KEY: linear inequality | graphing

16. ANS: A   PTS: 1   DIF: L3
    REF:  6-5 Linear Inequalities
    OBJ:  6-5.1 Graphing Linear Inequalities   STA: CA A1 6.0
    TOP:  6-5 Example 1
    KEY: linear inequality | graphing

17. ANS: D   PTS: 1   DIF: L2
    REF:  6-6 Systems of Linear Inequalities
    OBJ:  6-6.1 Solving Systems of Linear Inequalities by Graphing
    STA: CA A1 9.0   TOP: 6-6 Example 1
    KEY: linear inequality | graphing | system of linear inequalities | graphing a system of linear inequalities

18. ANS: A   PTS: 1   DIF: L2
    REF:  6-6 Systems of Linear Inequalities
    OBJ:  6-6.1 Solving Systems of Linear Inequalities by Graphing
    STA: CA A1 9.0   TOP: 6-6 Example 1
    KEY: linear inequality | graphing | system of linear inequalities | graphing a system of linear inequalities

19. ANS: C   PTS: 1   DIF: L2
    REF:  6-6 Systems of Linear Inequalities
    OBJ:  6-6.1 Solving Systems of Linear Inequalities by Graphing
    STA: CA A1 9.0   TOP: 6-6 Example 2
    KEY: linear inequality | graphing | system of linear inequalities | graphing a system of linear inequalities
SHORT ANSWER

20. ANS:

![Isosceles Triangle](image)

The figure is an isosceles triangle.

PTS: 1  DIF: L4  REF: 6-5 Linear Inequalities
OBJ: 6-5.1 Graphing Linear Inequalities  STA: CA A1 6.0
KEY: linear inequality | graphing

ESSAY

21. ANS:

\[
\frac{x + y}{3} = 16
\]

b. 
\[
\frac{x - y}{2} = 16
\]

c. 8 mph

[3] minor computation error
[2] misapplication of \(rt = d\) formula
[1] correct answer, but no equations shown

PTS: 1  DIF: L3  REF: 6-4 Applications of Linear Systems
OBJ: 6-4.1 Writing Systems of Linear Equations  STA: CA A1 9.0 | CA A1 15.0
KEY: extended response | rubric-based question | word problem | problem solving | system of linear equations | graphing a system of linear equations | substitution method | elimination method | motion problem
22. ANS:  
[4]  
(a) \( n + q = 8 \)  
(b) \( 5n + 25q = 140 \)  
(c) 5 quarters and 3 nickels  

[3] minor computation error  
[2] (a) and (b) correct  
[1] correct answer, but no equations shown  

PTS: 1  
DIF: L3  
REF: 6-4 Applications of Linear Systems  
OBJ: 6-4.1 Writing Systems of Linear Equations  
STA: CA A1 9.0 | CA A1 15.0  
KEY: extended response | rubric-based question | word problem | problem solving | system of linear equations | graphing a system of linear equations | substitution method | elimination method  

23. ANS:  
[4]  
(a) \( 8.5x + 6y \leq 60 \)  
\( y \geq 3 \)  

(b)  

(c) Answers may vary. Sample: (2,7); Amy can buy 2 international blends and 7 house blends for $59.  

[3] minor error in graph  
[2] minor error in inequalities  
[1] a correct solution given, with no inequality or graph  

PTS: 1  
DIF: L2  
REF: 6-6 Systems of Linear Inequalities  
OBJ: 6-6.2 Writing and Using Systems of Linear Inequalities  
STA: CA A1 9.0  
TOP: 6-6 Example 4  
KEY: extended response | rubric-based question | word problem | problem solving | linear inequality | graphing | system of linear inequalities | graphing a system of linear inequalities