Algebra 1 Chapter 03 Review

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

Write the inequality in words.

_____ 1. $3n < 52$
   a. fifty-two less than three times $n$
   b. Three times $n$ is less than fifty-two.
   c. Three times $n$ is less than or equal to fifty-two.
   d. Three times $n$ is greater than fifty-two.

Graph the inequality.

_____ 2. $k > \frac{9}{2}$
   a. 
   b. 
   c. 
   d. 

_____ 3. $x \leq 5$
   a. 
   b. 
   c. 
   d. 

_____ 4. $x \geq -3$
   a. 
   b. 
   c. 
   d.
Write an inequality for the graph.

5. ______________

-10 -8 -6 -4 -2 0 2 4 6 8 10

a. \( x \leq -8 \)  b. \( x < -8 \)  c. \( x > -8 \)  d. \( x < 8 \)

Write an inequality to model the situation.

6. A number exceeds 21.

- A. \( n \geq 21 \)  b. \( n \leq 21 \)  c. \( n > 21 \)  d. \( n < 21 \)

Solve the inequality. Then graph your solution.

7. \( q - \frac{1}{2} > \frac{1}{3} \)

- A. \( q > \frac{1}{6} \)  b. \( q > 1 \)  c. \( q > \frac{5}{6} \)  d. \( q < \frac{1}{6} \)

8. \( \frac{x}{4} \geq -6 \)

- A. \( x \leq -24 \)  b. \( x \geq -10 \)  c. \( x \geq -24 \)  d. \( x \geq 10 \)

9. \( 2x \geq 8 \)

- A. \( x \geq 4 \)  b. \( x \geq -6 \)  c. \( x \leq 4 \)  d. \( x > 6 \)

Solve the inequality.

10. \( -5.3 \geq 6.7 + 4.3 + q \)

- A. \( -15.3 \geq q \)  b. \( 16.3 \geq q \)  c. \( 15.3 \geq q \)  d. \( -16.3 \geq q \)
11. \( \frac{1}{3} + x + \frac{2}{9} \geq \frac{5}{6} \)
   a. \( x \geq \frac{5}{18} \)  
   b. \( x \leq \frac{17}{18} \)  
   c. \( x \geq \frac{17}{18} \)  
   d. \( x \geq \frac{7}{18} \)

12. \(-5x - 7 < 28\)
   a. \( x > -7 \)  
   b. \( x < -7 \)  
   c. \( x > \frac{21}{5} \)  
   d. \( x < -\frac{21}{5} \)

13. \(2(b - 8) > 12\)
   a. \( b > 20 \)  
   b. \( b > 6 \)  
   c. \( b > 14 \)  
   d. \( b < 20 \)

14. Jeanette wants to tile the floor of a room in her house. The square tiles measure \( \frac{3}{4} \) ft on each side. The room is 10 ft wide.
   a. Write an inequality to describe how many tiles are needed to make one row of tiles across the width of the room.
   b. Solve the inequality.
   c. How many tiles should Jeanette buy to form one row?
   a. \( \frac{3}{4} + t \geq 10; t \geq 13 \frac{1}{3}, 13 \)  
   b. \( \frac{3}{4} t \geq 10; t \geq 13 \frac{1}{3}, 13 \frac{1}{3} \)  
   d. \( \frac{3}{4} t \geq 10; t \geq 13 \frac{1}{3}, 14 \)

15. Alexandria wants to go hiking on Saturday. She will choose from several parks considering these conditions.
   - She wants to hike for 2 hours.
   - She wants to spend no more than 6 hours away from home.
   - She can average 65 miles per hour to and from the park.

   Write and solve an inequality to find possible distances from Alexandria’s home to a park that satisfies the conditions.
   a. \( 2 + \frac{65}{d} \leq 6; d \leq 16 \text{ miles} \)  
   b. \( 6 + \frac{d}{65} \geq 2; d \geq 392 \text{ miles} \)  
   c. \( 2 + \frac{d}{65} \leq 6; d \leq 260 \text{ miles} \)  
   d. \( 2 + \frac{d}{65} \leq 6; d \leq 392 \text{ miles} \)

   Write a compound inequality that represents each situation. Graph your solution.

16. On a road in the city of Rochester, the maximum speed is 50 miles per hour, and the minimum speed is 20 miles per hour.
   a. \( 20 > x > 50 \)  
   b. \( 20 < x < 50 \)  
   c. \( 20 \leq x \leq 50 \)  
   d. \( 20 \geq x \geq 50 \)
Write a compound inequality that the graph could represent.

17.  

-2 ≤ x < 4  
-4 < x ≤ 2  

18.  

d > -3 or d ≤ 1  
0 < d < 3  

Write an inequality for the situation.

19.  

all real numbers at most -9.5 or at least 5.5  

Solve the equation. If there is no solution, write no solution.

20.  

2|n| - 12 = 16  

21.  

-2|h - 7| = -28  

Short Answer

22. Eduardo solved -4x > 120 by adding 4 to each side of the inequality. What mistake did he make?

Essay

23. Suppose a classmate is having difficulty solving 4(x - 7) > 6x + 2 + 8x. Explain how to solve the inequality, showing all the necessary steps and identifying the properties you would use.

24. Three consecutive even numbers have a sum between 84 and 96.  
a. Write an inequality to find the three numbers. Let n represent the smallest even number.  
b. Solve the inequality.

25. Suppose you start with at least $52 in your savings account and deposit$27 each week. Write an inequality to describe how much money m you have after w weeks. If you do this for 11 weeks, will you have enough to buy a bicycle that costs $340? Show your work.
Algebra 1 Chapter 03 Review
Answer Section

MULTIPLE CHOICE

1. ANS: B    PTS: 1    DIF: L3    REF: 3-1 Inequalities and Their Graphs
   OBJ: 3-1.2 Graphing and Writing Inequalities in One Variable
   STA: CA A1 5.0    KEY: translating an inequality | inequality

2. ANS: D    PTS: 1    DIF: L2    REF: 3-1 Inequalities and Their Graphs
   OBJ: 3-1.2 Graphing and Writing Inequalities in One Variable
   STA: CA A1 5.0    TOP: 3-1 Example 3    KEY: graphing | inequality

3. ANS: B    PTS: 1    DIF: L2    REF: 3-1 Inequalities and Their Graphs
   OBJ: 3-1.2 Graphing and Writing Inequalities in One Variable
   STA: CA A1 5.0    TOP: 3-1 Example 3    KEY: graphing | inequality

4. ANS: B    PTS: 1    DIF: L2    REF: 3-1 Inequalities and Their Graphs
   OBJ: 3-1.2 Graphing and Writing Inequalities in One Variable
   STA: CA A1 5.0    TOP: 3-1 Example 3    KEY: graphing | inequality

5. ANS: C    PTS: 1    DIF: L2    REF: 3-1 Inequalities and Their Graphs
   OBJ: 3-1.2 Graphing and Writing Inequalities in One Variable
   STA: CA A1 5.0    TOP: 3-1 Example 4    KEY: writing an inequality from a graph | graphing

6. ANS: C    PTS: 1    DIF: L2    REF: 3-1 Inequalities and Their Graphs
   OBJ: 3-1.2 Graphing and Writing Inequalities in One Variable
   STA: CA A1 5.0    KEY: modeling with inequalities | translating an inequality

7. ANS: C    PTS: 1    DIF: L3    REF: 3-2 Solving Inequalities Using Addition and Subtraction
   OBJ: 3-2.1 Using Addition to Solve Inequalities
   STA: CA A1 5.0    TOP: 3-2 Example 1    KEY: Addition Property of Inequality | solving inequalities

8. ANS: C    PTS: 1    DIF: L2    REF: 3-3 Solving Inequalities Using Multiplication and Division
   OBJ: 3-3.1 Using Multiplication to Solve Inequalities
   STA: CA A1 5.0    TOP: 3-3 Example 1    KEY: Multiplication Property of Inequality for c > 0 | solving inequalities

9. ANS: A    PTS: 1    DIF: L2    REF: 3-3 Solving Inequalities Using Multiplication and Division
   OBJ: 3-3.2 Using Division to Solve Inequalities
   STA: CA A1 5.0    TOP: 3-3 Example 3    KEY: Division Property of Inequality | solving inequalities

10. ANS: D    PTS: 1    DIF: L3    REF: 3-2 Solving Inequalities Using Addition and Subtraction
    OBJ: 3-2.2 Using Subtraction to Solve Inequalities
    STA: CA A1 5.0    TOP: 3-2 Example 3    KEY: Subtraction Property of Inequality | solving inequalities | like terms

11. ANS: A    PTS: 1    DIF: L4    REF: 3-2 Solving Inequalities Using Addition and Subtraction
    OBJ: 3-2.2 Using Subtraction to Solve Inequalities
    STA: CA A1 5.0    TOP: 3-2 Example 3    KEY: Subtraction Property of Inequality | like terms | solving inequalities
12. ANS: A  PTS: 1  DIF: L2  REF: 3-4 Solving Multi-Step Inequalities
   OBJ: 3-4.1 Solving Inequalities With Variables on One Side
   TOP: 3-4 Example 1
   KEY: modeling with inequalities | multi-step inequality with variables on one side | solving inequalities

13. ANS: C  PTS: 1  DIF: L2  REF: 3-4 Solving Multi-Step Inequalities
   OBJ: 3-4.1 Solving Inequalities With Variables on One Side
   TOP: 3-4 Example 3
   KEY: solving inequalities using the Distributive Property | like terms | solving inequalities

14. ANS: D  PTS: 1  DIF: L4
   REF: 3-3 Solving Inequalities Using Multiplication and Division
   OBJ: 3-3.1 Using Multiplication to Solve Inequalities
   TOP: 3-3 Example 4
   KEY: Multiplication Property of Inequality for c > 0 | problem solving | word problem | solving inequalities | multi-part question

15. ANS: C  PTS: 1  DIF: L4
   REF: 3-4 Solving Multi-Step Inequalities
   OBJ: 3-4.1 Solving Inequalities With Variables on One Side
   TOP: 3-4 Example 2
   KEY: solving inequalities | problem solving | word problem | solving inequalities

16. ANS: C  PTS: 1  DIF: L2
   REF: 3-5 Compound Inequalities
   OBJ: 3-5.1 Solving Compound Inequalities Containing And
   TOP: 3-5 Example 3
   KEY: writing a compound inequality | compound inequality | solving inequalities

17. ANS: D  PTS: 1  DIF: L3
   REF: 3-5 Compound Inequalities
   OBJ: 3-5.1 Solving Compound Inequalities Containing And
   TOP: 3-5 Example 4
   KEY: writing a compound inequality | compound inequality

18. ANS: C  PTS: 1  DIF: L3
   REF: 3-5 Compound Inequalities
   OBJ: 3-5.2 Solving Compound Inequalities Joined by Or
   TOP: 3-5 Example 4
   KEY: writing a compound inequality | compound inequality

19. ANS: D  PTS: 1  DIF: L2
   REF: 3-5 Compound Inequalities
   OBJ: 3-5.2 Solving Compound Inequalities Joined by Or
   TOP: 3-4 Example 4
   KEY: writing a compound inequality | compound inequality | translating an inequality

20. ANS: A  PTS: 1  DIF: L3
   REF: 3-6 Absolute Value Equations and Inequalities
   OBJ: 3-6.1 Solving Absolute Value Equations
   TOP: 3-6 Example 1
   KEY: absolute value | Addition Property of Equality

21. ANS: C  PTS: 1  DIF: L3
   REF: 3-6 Absolute Value Equations and Inequalities
   OBJ: 3-6.1 Solving Absolute Value Equations
   TOP: 3-6 Example 2
   KEY: absolute value | Division Property of Equality
SHORT ANSWER

22. ANS:
He should have divided each side by \(-4\).

PTS: 1 DIF: L3
REF: 3-3 Solving Inequalities Using Multiplication and Division
OBJ: 3-3.2 Using Division to Solve Inequalities
STA: CA A1 5.0
TOP: 3-3 Example 3
KEY: Division Property of Inequality | writing in math | error analysis

ESSAY

23. ANS:
\[ 4(x - 7) > 6x + 2 + 8x \]
\[ 4x - 28 > 6x + 2 + 8x \]
\[ 4x - 28 > 14x + 2 \]
Use the Distributive Property
Combine like terms.
\[ 4x - 28 - 4x > 14x + 2 - 4x \]
\[ -28 > 10x + 2 \]
Subtraction Property of Inequality
Simplify.
\[ -28 - 2 > 10x + 2 - 2 \]
\[ -30 > 10x \]
Subtraction Property of Inequality
Simplify.
\[ \frac{-30}{10} > \frac{10x}{10} \]
Division Property of Inequality
\[ -3 > x \]
Simplify.

[3] one computational or property error
[2] two computational or property errors
[1] computational steps or properties missing

PTS: 1 DIF: L3
REF: 3-4 Solving Multi-Step Inequalities
OBJ: 3-4.2 Solving Inequalities With Variables on Both Sides
STA: CA A1 4.0 | CA A1 5.0
TOP: 3-4 Example 5
KEY: multi-step inequality | extended response | rubric-based question | writing in math
24. ANS: 
   [4] a. $84 \leq n + (n + 2) + (n + 4) \leq 96$
   b. $84 \leq n + n + 2 + n + 4 \leq 96$
      $84 \leq 3n + 6 \leq 96$
      $84 - 6 \leq 3n + 6 - 6 \leq 96 - 6$
      $78 \leq 3n \leq 90$
      $\frac{78}{3} \leq \frac{3n}{3} \leq \frac{90}{3}$
      $26 \leq n \leq 30$

   [3] one computational error
   [2] incorrect inequality OR two computational errors
   [1] one or more answers missing

PTS: 1        DIF: L4        REF: 3-5 Compound Inequalities
OBJ: 3-5.1 Solving Compound Inequalities Containing And     STA: CA A1 3.0
TOP: 3-5 Example 3
KEY: writing a compound inequality | solving a compound inequality containing AND | problem solving | word problem | extended response | rubric-based question

25. ANS: 
   [4] $m \geq 52 + 27w$
      $w = 11$, so
      $m \geq 52 + 27(11)$
      $m \geq 52 + 297$
      $m \geq 349$
      yes; because there is at least $349 in your account

   [3] one computational error or wrong conclusion
   [2] two computational errors or no work shown
   [1] no conclusion and one or more errors

PTS: 1        DIF: L3        REF: 3-2 Solving Inequalities Using Addition and Subtraction
OBJ: 3-2.2 Using Subtraction to Solve Inequalities     STA: CA A1 5.0
KEY: translating an inequality | modeling with inequalities | problem solving | word problem | extended response | rubric-based question