

Math 1 Chapter 2 Study Guide

Write the inequality as a sentence.

1) A number n is less than 4.

$$n < 4$$

2) A number y minus 8 is greater than or equal to 10.

$$y - 8 \geq 10$$

3) The number 21 is at least a number t times 3.

$$21 \geq 3t$$

4) Two-thirds of a number b is no more than 12.

$$\frac{2}{3}b \leq 12$$

Determine whether the value is a solution of the inequality.

5) $x - 5 > 10$; $x = 2$

$$\begin{array}{r} 2 - 5 > 10 \\ -3 > 10 \end{array} \quad \text{True}$$

6) $\frac{2}{3}y - 12 \leq 24$; $y = 48$

$$\begin{array}{r} \frac{2}{3}(48) - 12 \leq 24 \\ 32 - 12 \leq 24 \\ 20 \leq 24 \end{array} \quad \text{True}$$

7) $30 - 6w < -3(5 + 7w)$; $w = -4$

$$\begin{array}{r} 30 - 6(-4) < -3(5 + 7(-4)) \\ 30 + 24 < -3(5 - 28) \\ 54 < 69 \end{array} \quad \text{True}$$

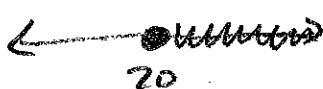
8) $2(4z + 6) \geq -8z + 12$; $z = -1$

$$\begin{array}{r} 2(4(-1) + 6) \geq -8(-1) + 12 \\ 2(2) \geq 8 + 12 \\ 4 \geq 20 \end{array} \quad \text{False}$$

Solve the inequality. Graph the solution.

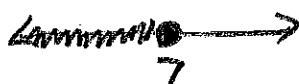
9) $4 + y \geq 24$

$$\begin{array}{r} -4 \quad -4 \\ \hline y \geq 20 \end{array}$$



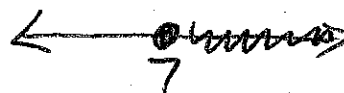
10) $c + 2 \leq 9$

$$\begin{array}{r} -2 \quad -2 \\ \hline c \leq 7 \end{array}$$



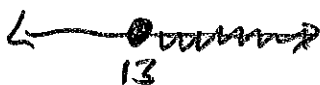
11) $-5h + 6h \geq 8 - 1$

$$h \geq 7$$



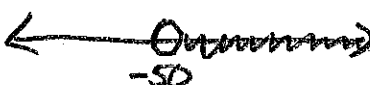
12) $b + 4 - 8 \geq 9$

$$\begin{array}{r} b - 4 \geq 9 \\ +4 \quad +4 \\ \hline b \geq 13 \end{array}$$



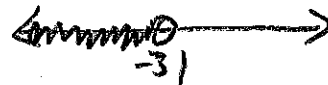
13) $28 - (-t) > -40 + 18$

$$\begin{array}{r} 28 + t > -22 \\ -28 \quad -28 \\ \hline t > -50 \end{array}$$



14) $20 - 3z + 4z < 9 - 20$

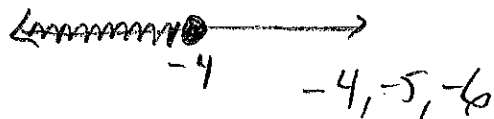
$$\begin{array}{r} z + 20 < -11 \\ -20 \quad -20 \\ \hline z < -31 \end{array}$$



Write the sentence as an inequality. Then solve the inequality. List 3 possible solutions.

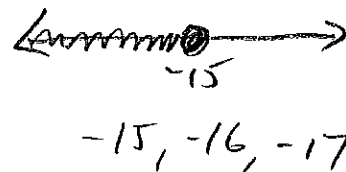
15) A number plus 12 is no more than 8.

$$\begin{array}{r} x + 12 \leq 8 \\ -12 \quad -12 \\ \hline x \leq -4 \end{array}$$



16) The difference of 20 and a number is at least 15.

$$\begin{array}{r} 20 - x \geq 15 \\ -20 \\ \hline -x \geq 15 \\ \frac{-1}{-1} \quad \frac{-1}{-1} \\ \hline x \leq -15 \end{array}$$



17) A lift gate on the back of a semi-truck trailer can lift at most 2000 pounds. You are loading a pallet that weighs 1835 pounds plus yourself. Write an inequality that represents the possible weights for yourself and solve the inequality.

$$\begin{array}{r} 1835 + x \leq 2000 \\ -1835 \quad -1835 \\ \hline x \leq 165 \end{array}$$

You must weigh no more than 165 lbs.

Solve the inequality. Graph the solution.

18) $\frac{9w}{9} \leq \frac{27}{9}$

$w \leq 3$

19) $\frac{-40}{8} \geq \frac{8y}{8}$

$-5 \geq y$ $y \leq -5$

20) $\frac{5}{5} \cdot \frac{1}{5} a > 7 \cdot \frac{5}{1}$

$a > 35$

21) $\frac{3}{-4} g < 18 \cdot \frac{-4}{3}$

$g > -24$

22) $-7 > \frac{-1}{11} d \cdot \frac{-11}{1}$

$77 < d$ $d > 77$

23) $\frac{-4}{-4} \cdot \frac{w}{-4} \leq 12 \cdot \frac{-4}{-4}$

$w \geq -48$

24) $3u - 7 \leq 14$

$3u \leq 21$
 $u \leq 7$

25) $-11 \geq 13 - 6n$

$-24 \geq -6n$
 $4 \leq n$ $n \geq 4$

26) $7 + \frac{p}{3} < 2$

$3 \cdot \frac{p}{3} < -5 \cdot 3$
 $p < -15$

27) $7w + 1 < w - 5$

$6w + 1 < -5$
 $6w < -6$
 $w < -1$

28) $3(g - 5) > 3g$

$3g - 15 > 3g$
 $-15 > 0$ False
 No Solution

29) $2(h - 2) \leq -2(1 - h)$

$2h - 4 \leq -2 + 2h$
 $-4 \leq -2$ True
 All Real Numbers

30) You are saving \$12 per week to purchase a new kayak. Prices start at \$300 and go up. Your parents give you \$144 to help you purchase your kayak. Write and solve an inequality to find the number of weeks you need to save to purchase the kayak.

$144 + 12x \geq 300$
 $12x \geq 156$
 $x \geq 13$

It will take at least 13 weeks

Write a compound inequality that is represented by the graph.

31) $-2 \leq x < 3$

32) $x < -7$ or $x \geq -1$

Write the sentence as an inequality. Graph the inequality.

33) A number b is greater than 3 and less than 8.

$$3 < x < 8$$

34) A number m is more than 4 or less than or equal to -3.

$$x \leq -3 \text{ or } x > 4$$

Solve the inequality. Graph the solution.

35) $-1 < 9 + n < 17$
 $\begin{array}{ccc} -9 & -9 & -9 \end{array}$

$$-10 < n < 8$$



36) $-50 < 7k + 6 < -8$
 $\begin{array}{ccc} -6 & -6 & -6 \end{array}$

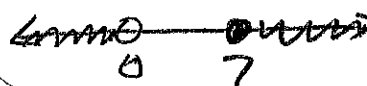
$$\frac{-56 < 7k < -14}{7}$$

$$-8 < k < -2$$

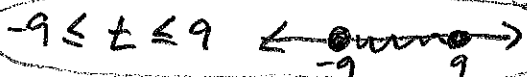


37) $g + 5 \geq 12$ or $\frac{g}{9} < 0.9$
 $\begin{array}{cc} -5 & -5 \end{array}$

$$g \geq 7 \text{ or } g < 0$$

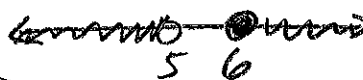


38) $8t + 8 \geq -64$ and $-7 - 8t \geq -79$
 $\begin{array}{ccc} -8 & -8 & +7 & +7 \end{array}$
 $\frac{8t}{8} \geq \frac{-72}{8}$ $\frac{-8t}{-8} \geq \frac{-72}{-8}$
 $t \geq -9$ and $t \leq 9$



39) $\frac{2x}{2} < \frac{10}{2}$ or $\frac{2x}{2} \geq \frac{3 \cdot 2}{2}$

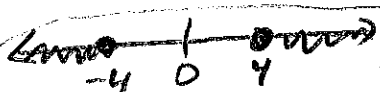
$$x < 5 \text{ or } x \geq 6$$



Solve the inequality. Graph the solution, if possible.

40) $|x| \geq 4$

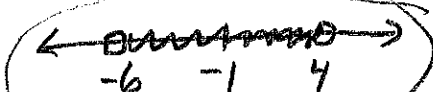
Distance from 0 is more than 4



$$x \leq -4 \text{ or } x \geq 4$$

41) $|x + 1| < 5$

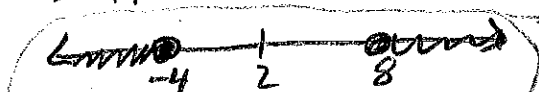
Dist. from -1 is less than 5



$$-6 < x < 4$$

42) $|x - 2| \geq 6$

Dist. from 2 is more than 6

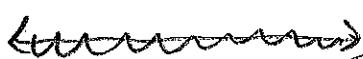


$$x \leq -4 \text{ or } x \geq 8$$

43) $|x + 9| \geq -4$

Always true

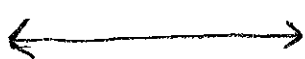
All Real Numbers



44) $|x + 56| < -5$

Never True

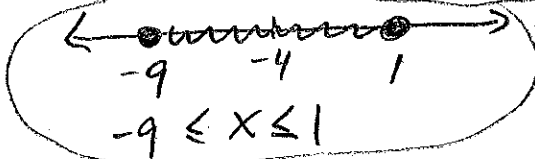
No Solution



45) $|x + 4| - 3 \leq 2$
 $\begin{array}{cc} +3 & +3 \end{array}$

$$|x + 4| \leq 5$$

Dist from -4 is less than 5



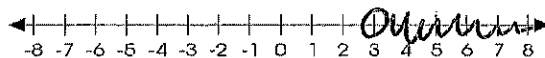
Describe and correct the error in solving the inequality.

46) $-3t + 2 \leq -4$ $\frac{-3t + 2 \leq -4}{-2 \quad -2}$
 $-3t \leq -4$ $\frac{-3t \leq -6}{-3 \quad -3}$
 $t \geq \frac{4}{3}$ $t \geq 2$

Didn't subtract 2 from right side in step 1

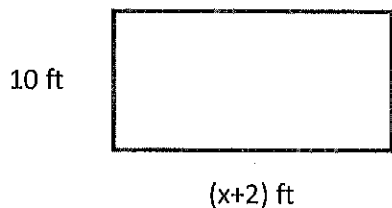
47) $x + 7 < 10$
 $-7 \quad -7$
 $x < 3$

Shaded wrong part of graph



Write an inequality for each scenario. Then solve for x and graph the solution.

48) The area of the rectangle is greater than 60 square feet. What are the possible values of x?



$$10(x+2) > 60$$

$$10x + 20 > 60$$

$$\begin{array}{r} -20 \\ -20 \end{array}$$

$$\frac{10x}{10} > \frac{40}{10}$$

$$x > 4$$

x must be greater than 4

Add or subtract.

49) $5 - 8$

-3

50) $-1 + (-17)$

-18

51) $-5 - (-7)$

$-5 + 7$

2

52) $20 + (-3)$

17

Multiply or divide.

53) $-9(8)$

-72

54) $-19 \cdot (-2)$

38

55) $-42 \div 6$

-7

56) $52 \div (-4)$

-13

Solve the equation. Check your solution.

57) $x + 2 = 9$

$\begin{array}{r} -2 \\ -2 \end{array}$

$x = 7$

58) $\frac{7b}{7} = \frac{49}{7}$

$b = 7$

59) $\frac{y}{13} = 5 \cdot 13$

$y = 65$

60) $5x - 10 = -10$

$\begin{array}{r} +10 \\ +10 \end{array}$

$5x = 0$

$x = 0$

61) $36 = 12u - 3u$

$\frac{36}{9} = \frac{9u}{9}$

$4 = u$

62) $11 = 1 - w$

$\begin{array}{r} -1 \\ -1 \end{array}$

$10 = -w$

$-10 = w$

63) $8 = \frac{c}{7} + 4$

$\begin{array}{r} -4 \\ -4 \end{array}$

$7 \cdot 8 = \frac{c}{7} \cdot 7$

$56 = c$

64) $17x - 3 - 5x = 45$

$12x - 3 = 45$

$\begin{array}{r} +3 \\ +3 \end{array}$

$\frac{12x}{12} = \frac{48}{12}$

$x = 4$

65) $\frac{z+5}{2} = 3 \cdot 2$

$x + 5 = 6$

$\begin{array}{r} -5 \\ -5 \end{array}$

$x = 1$

Simplify.

66) $-|14|$

-14

67) $|12| - |-12|$

$12 - 12$

0

68) $\left| \frac{-24}{-2} \right|$

$|12|$

12