

Chapter 6 Practice Test (2023)

NOTE: 8 pts each unless otherwise stated

Draw a graph for each inequality. (2pts each)

1) $x \geq 3$



3) $5 \leq x$ Rewrite



5) $x \leq -7$ and $x \geq -10$



BOTH CLOSED DOTS

2) $3 < x$ Rewrite variable on the

left side. Then Ineq symbol & arrow go in the same direction

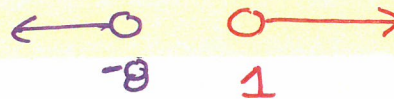
$x > 3$



4) $x > -5$



6) $x > 1$ or $x < -8$



BOTH OPEN DOTS

Write an inequality for each graph below the graph. Use the variable "X" and circle your answer. (2pts each)

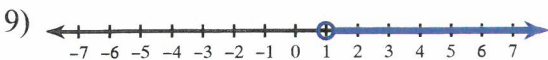
X MUST BE ON THE LEFT SIDE FOR #'S 7-10



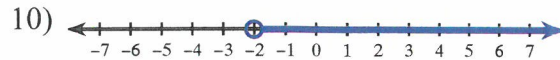
$x \geq 5$



$x \geq -6$



$x > 1$



$x > -2$

11)



$-5 \leq x < 4$

OR

$x \geq -5$ AND $x < 4$

12)



$x < 2$ OR $x > 10$

(6PTS) SOLVE each inequality. Circle the solution. Then GRAPH its solution.

13) $-4(n+2) > -84$

$$\begin{array}{r} -4n - 8 > -84 \\ +8 \quad +8 \\ \hline -4n > -76 \\ \div -4 \quad \div -4 \\ \hline n < 19 \end{array}$$

Switch

14) $\frac{x}{2} + 8 < 18$

$$\begin{array}{r} \frac{x}{2} + 8 < 18 \\ -8 \quad -8 \\ \hline \frac{x}{2} < 10 \\ \times 2 \quad \times 2 \\ \hline x < 20 \end{array}$$

15) $64 \geq 8(10+n)$

$$\begin{array}{r} 64 \geq 80 + 8n \\ -80 \quad -80 \\ \hline -16 \geq 8n \\ \div 8 \quad \div 8 \\ \hline -2 \geq n \end{array}$$

Rewrite

$$\boxed{n \leq -2}$$

16) $-6 > \frac{x}{4} - 7$

$$\begin{array}{r} -6 > \frac{x}{4} - 7 \\ +7 \quad +7 \\ \hline 1 > \frac{x}{4} \\ \times 4 \quad \times 4 \\ \hline 4 > x \end{array}$$

Rewrite

$$\boxed{x < 4}$$

17) $x - 21 > 5(x - 5)$

$$\begin{array}{r} x - 21 > 5x - 25 \\ -5x \quad -5x \\ \hline -4x - 21 > -25 \\ +21 \quad +21 \\ \hline -4x > -4 \\ \div -4 \quad \div -4 \\ \hline x < 1 \end{array}$$

Switch

18) $-25 - 8x \geq 3(1 - x) - 8$

$$\begin{array}{r} -8x - 25 \geq 3 - 3x - 8 \\ -8x - 25 \geq -3x - 5 \\ +3x \quad +3x \\ \hline -5x - 25 \geq -5 \\ +25 \quad +25 \\ \hline -5x \geq 20 \\ \div -5 \quad \div -5 \\ \hline x \leq -4 \end{array}$$

Switch

SOLVE each inequality. Circle the solution. Then GRAPH its solution.

19) $-4 - n > -(n + 4)$

$$\begin{array}{r} -n - 4 > -n - 4 \\ +n \quad +n \\ \hline -4 > -4 \text{ (F)} \end{array}$$

\rightarrow $N = \text{NO SOLUTION}$

20) $6(n + 5) + 5n \geq 2n + 21$

$$6n + 30 + 5n \geq 2n + 21$$

$$\begin{array}{r} 11n + 30 \geq 2n + 21 \\ -2n \quad -2n \\ \hline 9n + 30 \geq 21 \end{array}$$

$$\begin{array}{r} 9n + 30 \geq 21 \\ -30 \quad -30 \\ \hline 9n \geq -9 \end{array}$$

$$\frac{9n}{9} \geq \frac{-9}{9}$$

$n \geq -1$

Do NOT switch



21) $13 + 4x \geq 5(1 + 3x) + 8$

$$4x + 13 \geq 5 + 15x + 8$$

$$4x + 13 \geq 15x + 13$$

$$\begin{array}{r} -15x \quad -15x \\ \hline -11x + 13 \geq 13 \\ -13 \quad -13 \\ \hline -11x \geq 0 \end{array}$$

$$\frac{-11x}{-11} \geq \frac{0}{-11}$$

$x \leq 0$

Switch



22) $-4(1 + x) \leq -4 - 4x$

$$\begin{array}{r} -4 - 4x \leq -4 - 4x \\ +4x \quad +4x \\ \hline -4 \leq -4 \text{ (T)} \end{array}$$

\rightarrow $x = \text{ALL Real \#}'s$

(6PTS) SOLVE each compound inequality. Circle the solution. Then GRAPH its solution.

23) $32 \leq 8 + 8x < 72$

$$\begin{array}{r} -8 \quad -8 \quad -8 \\ \hline 24 \leq 8x < 64 \\ \hline 8 \quad 8 \quad 8 \end{array}$$

$$\boxed{3 \leq x < 8}$$



24) $-8 < -2n + 10 \leq 26$

$$\begin{array}{r} -10 \quad -10 \quad -10 \\ \hline -18 < -2n \leq 16 \\ \hline -2 \quad -2 \quad -2 \end{array}$$

$$9 > n \geq -8$$

$$\boxed{-8 \leq n < 9}$$



switch
Rewrite

25) $2 - 2x \geq 10 + 6x$ or $-4 + 8x > 8 + 2x$

$$\begin{array}{r} -6x \quad -6x \\ \hline -8x + 2 \geq 10 \\ \hline -2 \quad -2 \\ \hline -8x \geq 8 \\ \hline -8 \quad -8 \\ \hline x \leq -1 \end{array}$$

$$\begin{array}{r} -2x \quad -2x \\ \hline 6x - 4 > 8 \\ \hline +4 \quad +4 \\ \hline 6x > 12 \\ \hline 6 \quad 6 \\ \hline x > 2 \end{array}$$

$$\boxed{x \leq -1 \text{ OR } x > 2}$$



26) $-5x + 4 \leq 8 - 9x$ or $9 + 3x < 4x + 3$

$$\begin{array}{r} +9x \quad +9x \\ \hline 4x + 4 \leq 8 \\ \hline -4 \quad -4 \\ \hline 4x \leq 4 \\ \hline 4 \quad 4 \\ \hline x \leq 1 \end{array}$$

$$\begin{array}{r} -4x \quad -4x \\ \hline -x + 9 < 3 \\ \hline -9 \quad -9 \\ \hline -x < -6 \\ \hline -1 \quad -1 \\ \hline x > 6 \end{array}$$

$$\boxed{x \leq 1 \text{ OR } x > 6}$$



switch #2 items

27) $5 - 9x > 1 - 7x$ or $6x + 2 \geq 3x + 5$

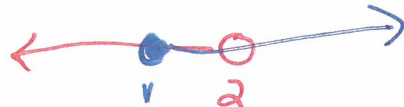
$$\begin{array}{r} +7x \quad +7x \\ \hline -2x + 5 > 1 \\ \hline -5 \quad -5 \\ \hline -2x > -4 \\ \hline -2 \quad -2 \\ \hline x < 2 \end{array}$$

$$\begin{array}{r} -3x \quad -3x \\ \hline 3x + 2 \geq 5 \\ \hline -2 \quad -2 \\ \hline 3x \geq 3 \\ \hline 3 \quad 3 \\ \hline x \geq 1 \end{array}$$

$$\boxed{x < 2 \text{ OR } x \geq 1}$$

switch

GRAPH:



"OR" OVERLAPS & COVERS THE ENTIRE NUMBER LINE

$$\boxed{x = \text{ALL REAL \#}'S}$$

(continue) SOLVE each compound inequality. Circle the solution. Then GRAPH its solution.

$$28) \begin{array}{l} 5 - 6n < 3 - 8n \text{ and } 3 + 4n \geq 3 - 5n \\ \begin{array}{r} +8n \quad +8n \\ \hline 2n + 5 < 3 \\ -5 \quad -5 \\ \hline 2n < -2 \\ \hline n < -1 \end{array} \quad \begin{array}{r} +5n \quad +5n \\ \hline 9n + 3 \geq 3 \\ -3 \quad -3 \\ \hline 9n \geq 0 \\ \hline n \geq 0 \end{array} \\ \hline \boxed{n < -1 \text{ AND } n \geq 0} \end{array}$$

← 0 0 →
 $\boxed{n = \text{NO SOLUTION}}$
 Why? "AND" DID NOT OVERLAP.

29) $-39 \leq -10x + 1 \leq 11$

$$\begin{array}{l} -1 \quad -1 \\ \hline -40 \leq -10x \leq 10 \\ \hline -10 \quad -10 \quad -10 \\ \hline 4 \geq x \geq -1 \end{array}$$

SWITCH
 REWRITE
 $\boxed{-1 \leq x \leq 4}$

BONUS (+2,+4) solve absolute value equations (6.5)

30) $|2x - 2| = 8$ **SPLIT**

$$\begin{array}{l} 2x - 2 = +8 \\ +2 \quad +2 \\ \hline 2x = 10 \\ \hline x = 5 \\ \boxed{x = 5} \end{array} \quad \begin{array}{l} 2x - 2 = -8 \\ +2 \quad +2 \\ \hline 2x = -6 \\ \hline x = -3 \\ \boxed{x = -3} \end{array}$$

C: $|2(5) - 2| = 8$
 $|8| = 8$
 $8 = 8 \checkmark$

C: $|2(-3) - 2| = 8$
 $|-8| = 8$
 $8 = 8 \checkmark$

31) $-10 - 5|x - 8| = -25$ **ISOLATE !!**

$$\begin{array}{l} +10 \quad +10 \\ \hline -5|x - 8| = -15 \\ \hline -5 \quad -5 \\ \hline |x - 8| = 3 \end{array}$$

SPLIT

$$\begin{array}{l} x - 8 = +3 \\ +8 \quad +8 \\ \hline x = 11 \\ \boxed{x = 11} \end{array} \quad \begin{array}{l} x - 8 = -3 \\ +8 \quad +8 \\ \hline x = 5 \\ \boxed{x = 5} \end{array}$$

Check in orig EQ!!

$$x = 11 \rightarrow -10 - 5|11 - 8| = -25$$

$$-10 - 5(3) = -25$$

$$-25 = -25 \checkmark$$

$$x = 5 \rightarrow -10 - 5|5 - 8| = -25$$

$$-10 - 5(+3) = -25$$

$$-25 = -25 \checkmark$$