

6.4 Practice "Compound Inequalities"

Date _____ Period _____

Practice graphing compound inequalities

NOTES: "AND" → is where they overlap
"OR" → is combining the 2 ineq's

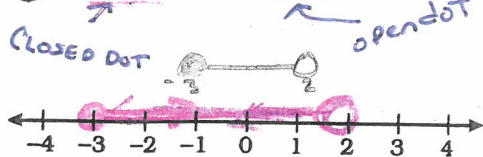
How Do You Find the Archery Range at Summer Camp?

For each compound inequality, graph each of the inequalities, then the solution. Write the solution letter in each box containing the exercise number.

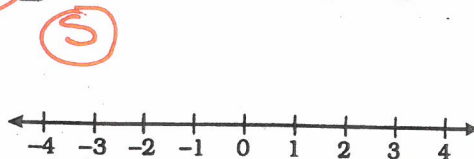
5	10	8	8	10	3	1	6	4	7	9	9	10	3	2
F	O	L	L	O	W	T	H	E	A	R	R	W	S	

1 $x \geq -3$ and $x < 2$ (T)

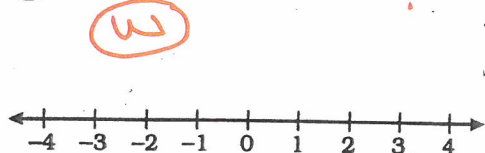
Overlap



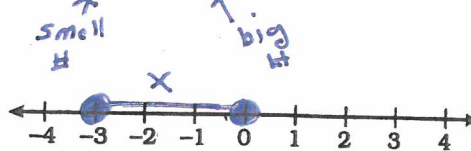
2 $x > -3$ and $x \geq 2$ (S)



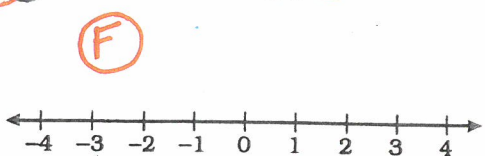
3 $x \leq 3$ and $x < -1$ (W)



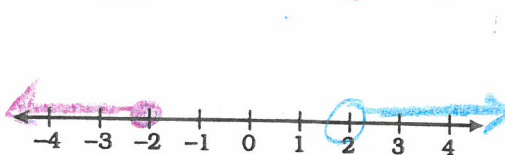
4 $-3 \leq x \leq 0$ (E)



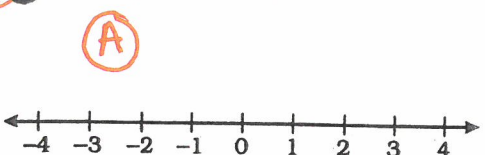
5 $x > -2$ or $x \geq 1$ (F)



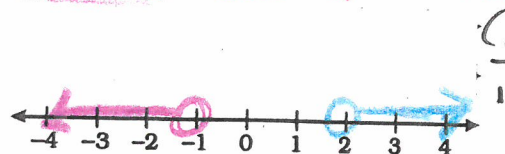
6 $x \leq -2$ or $x > 2$ (H)



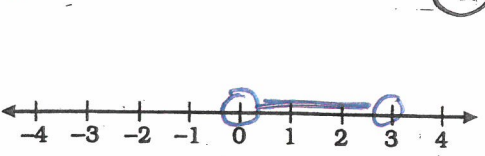
7 $x < 0$ or $x \leq 3$ (A)



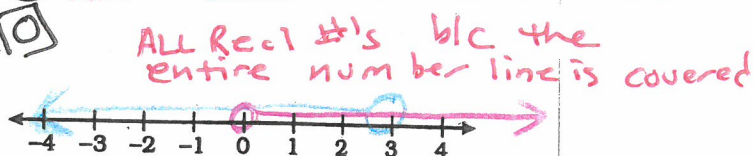
8 $x < -1$ or $x > 2$ (L)



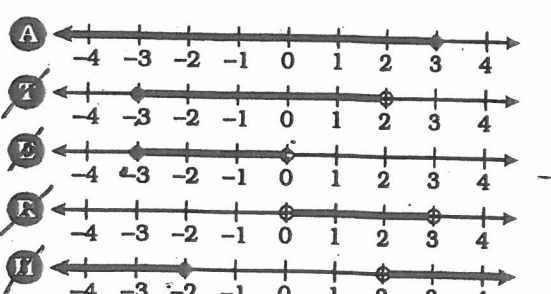
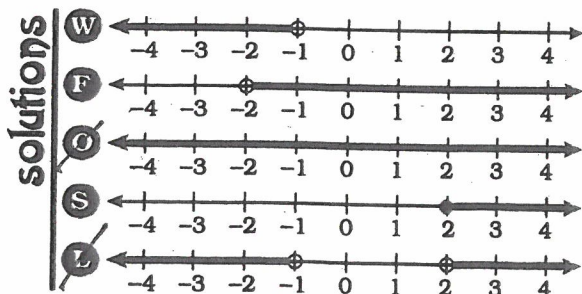
9 $0 < x < 3$ (R)



10 $x > 0$ or $x < 3$ *OR "SPECIAL CASE"



ALL Real #'s b/c the entire number line is covered



6.4 Practice "Compound Inequalities"

Practice graphing compound inequalities

Solve each compound inequality and graph its solution.

1) $-40 < 8n \leq -8$

$\frac{-40}{8} < \frac{8n}{8} \leq \frac{-8}{8}$

$-5 < n \leq -1$



2) $-30 \leq -3x \leq 0$

$\frac{-30}{-3} \leq \frac{-3x}{-3} \leq \frac{0}{-3}$

$10 \geq x \geq 0$

$0 \leq x \leq 10$

SWITCH SYMBOLS

Rewrite to Graph



3) $x + 3 \leq 9$ and $-4x < 20$

$\frac{x+3-3}{-4} \leq \frac{9-3}{-4}$ and $\frac{-4x}{-4} < \frac{20}{-4}$ SWITCH

$x \leq 6$ AND $x > -5$



4) $-5m \geq 20$ and $\frac{m}{9} > -1$

$\frac{-5m}{-5} \geq \frac{20}{-5}$ and $\frac{m}{9} > -1 \cdot 9$ SWITCH

$m \leq -4$ AND $m > -9$



5) $-4n < 12$ or $\frac{n}{4} \leq -2$

$\frac{-4n}{-4} < \frac{12}{-4}$ or $\frac{n}{4} \leq -2 \cdot 4$ SWITCH



6) $x + 4 \leq -6$ or $-2x < 6$

$\frac{x+4-4}{-2} \leq \frac{-6-4}{-2}$ or $\frac{-2x}{-2} < \frac{6}{-2}$ SWITCH



$$7) \quad 7n \leq -14 \text{ and } n + 7 > 16$$

$$\frac{-7}{7} \quad \frac{-7}{7} \quad \frac{-7}{7} \quad \frac{-7}{7}$$

$$n \leq -2 \text{ AND } n > 9$$



"AND" DOES NOT INTERSECT

N = NO SOLUTION

$$9) \quad x - 1 \leq 3 \text{ and } -8 - 5x \leq -3$$

$$\frac{+1}{+1} \quad \frac{+8}{+8} \quad \frac{+8}{+8}$$

$$x \leq 4 \quad -5x \leq 5$$

$$\frac{-5}{-5} \quad \frac{-5}{-5}$$

switch

$$x \leq 4 \text{ AND } x > -1$$



$$8) \quad -8x \leq 80 \text{ or } \frac{x}{7} \leq 0$$

$$\frac{-8}{-8} \quad \frac{x}{7} \leq 0$$

$$x \geq -10 \text{ OR } x \leq 0$$



"OR" OVERLAPS

$$x = \text{ALL REAL \#S!}$$

$$10) \quad 9 + 7x > 58 \text{ or } 5x - 6 < -41$$

$$\frac{-9}{7} \quad \frac{-9}{7} \quad \frac{+6}{5} \quad \frac{+6}{5}$$

$$7x > 49 \quad 5x < -35$$

$$\frac{7}{7} \quad \frac{5}{5}$$

$$x > 7 \text{ OR } x < -7$$



$$11) \quad -42 < 4k - 10 < -22$$

$$\frac{+10}{4} \quad \frac{+10}{4} \quad \frac{+10}{4}$$

$$-32 < 4k < -12$$

$$\frac{-32}{4} \quad \frac{-12}{4}$$

$$-8 < k < -3$$



$$12) \quad -11 < 1 - 4a \leq 9$$

$$\frac{-1}{-4} \quad \frac{-1}{-4} \quad \frac{-1}{-4}$$

$$-12 < -4a \leq 8$$

$$\frac{-12}{-4} \quad \frac{8}{-4}$$

APPLY TO ALL 3 PARTS!

$$3 > a \geq -2$$

SWITCH SYMBOLS

Rewrite to graph

$$-2 \leq a < 3$$



13) $10x - 6 > 6x + 10$ or $8 - 8x \geq 6x + 8$

$$\begin{array}{r} -6x \quad -6x \\ \hline 4x - 6 > 10 \\ +6 \quad +6 \\ \hline 4x > 16 \\ \hline x > 4 \end{array}$$

$$\begin{array}{r} -6x \quad -6x \\ \hline -14x + 8 \geq 8 \\ -8 \quad -8 \\ \hline -14x \geq 0 \\ \hline -14 \quad -14 \\ \hline x \leq 0 \end{array}$$

$x > 4$ OR $x \leq 0$



14) $2 - 7x > 6 - 5x$ and $8x - 2 > 7x - 9$

$$\begin{array}{r} +5x \quad +5x \\ \hline -2x + 2 > 6 \\ -2 \quad -2 \\ \hline -2x > 4 \\ \hline -2 \quad -2 \\ \hline x < -2 \end{array}$$

$$\begin{array}{r} -7x \quad -7x \\ \hline x - 2 > -9 \\ +2 \quad +2 \\ \hline x > -7 \end{array}$$

$x < -2$ AND $x > -7$



15) $-4x - 4 > 7 + 7x$ or $9x - 1 > 8x + 2$

$$\begin{array}{r} -7x \quad -7x \\ \hline -11x - 4 > 7 \\ +4 \quad +4 \\ \hline -11x > 11 \\ \hline -11 \quad -11 \\ \hline x < -1 \end{array}$$

$$\begin{array}{r} -8x \quad -8x \\ \hline x - 1 > 2 \\ +1 \quad +1 \\ \hline x > 3 \end{array}$$

$x < -1$ OR $x > 3$



16) $-2n + 9 \leq 10n + 9$ or $8n + 1 > 10n - 7$

$$\begin{array}{r} -10n \quad -10n \\ \hline -12n + 9 \leq 9 \\ -9 \quad -9 \\ \hline -12n \leq 0 \\ \hline -12 \quad -12 \\ \hline n \geq 0 \end{array}$$

$$\begin{array}{r} -10n \quad -10n \\ \hline -2n + 1 > -7 \\ -1 \quad -1 \\ \hline -2n > -8 \\ \hline -2 \quad -2 \\ \hline n < 4 \end{array}$$

$n \geq 0$ OR $n < 4$



"OR" OVERLAPS

$n = \text{ALL REAL \#s}$