

6.4 Notes: Linear Inequalities In One Variable

Key

see pg 342 Graphing / Key words

1-6 Solve and graph the solution set of each of the following:

1) $5x + 1 \leq 4(x + 3)$

$$\begin{array}{r} 5x + 1 \leq 4x + 12 \\ -4x \quad -1 \quad -4x \quad -1 \\ \hline \end{array}$$

$x \leq 11$



2) $2 - 4x < 6$

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

$x > -1$



3) $7(x + 3) - 3 > 4(2 - x) + x$

$$\begin{array}{r} 7x + 21 - 3 > 8 - 4x + x \\ 7x + 18 > -3x + 8 \\ +3x \quad -18 \quad +3x \quad -18 \\ \hline 10x > -10 \\ 10 \quad 10 \\ \hline \end{array}$$

$x > -1$



4) $\frac{2}{5}x - \frac{7}{10} > \frac{9}{10}x - \frac{1}{5}$

$$\begin{array}{r} 4x - 7 > 9x - 2 \\ -4x \quad +2 \quad -4x \quad +2 \\ \hline -5 > 5x \\ 5 \quad 5 \\ \hline -1 > x \end{array}$$

$x < -1$



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5) $-3 < 4x + 1 \leq 9$

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

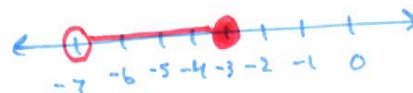
$-1 < x \leq 2$



6) $20 \leq 5 - 5x < 40$

$$\begin{array}{r} -5 \quad -5 \quad -5 \\ \hline 15 \leq -5x < 35 \\ -5 \quad -5 \quad -5 \\ \hline -3 \geq x > -7 \end{array}$$

$-7 < x \leq -3$



7-11 Write an inequality then solve.

7) A number increased by 10 is at least 3 times the number.

$$\begin{array}{r}
 x+10 \geq 3x \\
 -x \quad -x \\
 \hline
 10 \geq 2x \\
 \frac{10}{2} \geq \frac{2x}{2} \\
 5 \geq x \\
 \boxed{x \leq 5}
 \end{array}$$

8) Twice the sum of five and a number is at most 24.

$$\begin{array}{r}
 2(x+5) \leq 24 \\
 2x+10 \leq 24 \\
 -10 \quad -10 \\
 \hline
 2x \leq 14 \\
 \frac{2x}{2} \leq \frac{14}{2} \\
 \boxed{x \leq 7}
 \end{array}$$

9) If the quotient of four times a number and three is increased by two, the result is no less than 10.

$$\begin{array}{r}
 \frac{4x}{3} + 2 \geq 10 \\
 -2 \quad -2 \\
 \hline
 3. \frac{4x}{3} \geq 8.3 \\
 \frac{4x}{4} \geq \frac{24}{4} \\
 x \geq 6
 \end{array}$$

10) To earn a B in Year 4, you must have a final average of at least 80%. On the first three tests, you have grades of 82%, 74%, and 78%. If the final exam counts as two test grades, what must you get on the final to earn a B in the class? (Assume grades in Year 4 are based on tests only.)

$$\begin{array}{r}
 \frac{82+74+78+x+x}{5} \geq 80 \\
 5x \frac{234+2x}{5} \geq 80 \cdot 5 \\
 234+2x \geq 400 \\
 -234 \quad -234 \\
 \hline
 2x \geq 166 \\
 \frac{2x}{2} \geq \frac{166}{2} \\
 \boxed{x \geq 83\%}
 \end{array}$$

11) A car can be rented from Hertz Rental for \$260 per week with no extra charge for mileage. Ovis charges \$80 per week plus 25 cents for each mile driven to rent the same car. How many miles must be driven in a week to make the rental cost at Hertz a better deal than at Ovis.

<u>H</u>	<u>O</u>	
\$260/wk	\$80/wk	
	\$0.25/mile	

$$\begin{array}{r}
 80 + .25x > 260 \\
 -80 \quad -80 \\
 \hline
 .25x > 180 \\
 \frac{.25x}{.25} > \frac{180}{.25} \\
 \boxed{x > 720 \text{ miles}}
 \end{array}$$