

Inequalities Review

Graph the following on the number line.

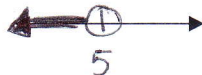
1. $x \leq 3$



2. $y \geq -5$



3. $k < 5$



4. $j > -6$



Solve, graph and check.

5. $2a - 5 > 17$

$$\begin{array}{r} +5 \quad +5 \\ 2a > 22 \\ \hline a > 11 \end{array}$$

$$a > 11$$



CK: $2(12) - 5 > 17$
 $24 - 5 > 17$
 $19 > 17$

6. $-5d + 7 \geq -38$

$$\begin{array}{r} -7 \quad -7 \\ -5d \geq -45 \\ \hline d \leq 9 \end{array}$$

$$d \leq 9$$



CK: $-5(0) + 7 \geq -38$
 $7 \geq -38$

7. $\frac{b}{-2} - 12 \leq 11$

$$\begin{array}{r} +12 \quad +12 \\ -\frac{b}{2} \leq 23 \\ \hline b \geq -46 \end{array}$$

$$b \geq -46$$

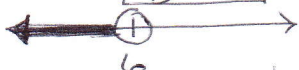


$-\frac{30}{-2} - 12 \leq 11$
 $15 - 12 \leq 11$
 $3 \leq 11$

8. $-12 + 11y < 54$

$$\begin{array}{r} +12 \quad +12 \\ 11y < 66 \\ \hline y < 6 \end{array}$$

$$y < 6$$

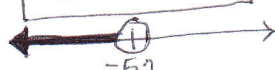


$-12 + 11(2) < 54$
 $-12 + 22 < 54$
 $10 < 54$

9. $\frac{c}{4} + 7 < -6$

$$\begin{array}{r} -7 \quad -7 \\ \frac{c}{4} < -13 \\ \hline c < -52 \end{array}$$

$$c < -52$$

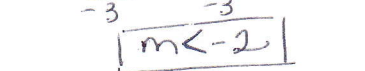


$-\frac{60}{4} + 7 < -6$
 $-15 + 7 < -6$
 $-8 < -6$

10. $-3(m-2) > 12$

$$\begin{array}{r} -6 \quad -6 \\ -3m < 6 \\ \hline m < -2 \end{array}$$

$$m < -2$$

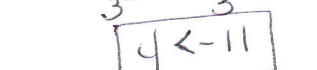


$-3(-4-2) > 12$
 $-3(-6) > 12$
 $18 > 12$

11. $10y + 4 < 7y - 29$

$$\begin{array}{r} -7y \quad -7y \\ 3y + 4 < -29 \\ \hline 3y < -33 \\ \hline y < -11 \end{array}$$

$$y < -11$$



$10(-12) + 4 < 7(-12) - 29$
 $-120 + 4 < -84 - 29$
 $-116 < -113$

12. $5 + 9a < -19$

$$\begin{array}{r} -5 \quad -5 \\ 9a < -24 \\ \hline a < -2\frac{8}{9} \end{array}$$

$$a < -2\frac{8}{9}$$



$5 + 9(-3) < -19$
 $5 - 27 < -19$
 $-22 < -19$

Write an inequality to represent each situation. Then solve, graph and check.

13. Six more than the product of 3 and a number is less than 39.

$$3x + 6 < 39$$

$$\begin{array}{r} 3x + 6 < 39 \\ -6 \quad -6 \\ \hline \end{array}$$

$$\frac{3x}{3} < \frac{33}{3}$$

$$x < 11$$



$$3(10) + 6 < 39$$

$$30 + 6 < 39$$

$$36 < 39$$

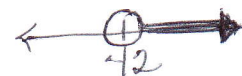
14. Five less than half a number is greater than 16.

$$\frac{n}{2} - 5 > 16$$

$$\begin{array}{r} \frac{n}{2} - 5 > 16 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\frac{n}{2} > 21$$

$$n > 42$$



$$\frac{44}{2} - 5 > 16$$

$$22 - 5 > 16$$

$$17 > 16$$

15. The owner of a lawn mower repair shop charges \$5 to diagnose the problem. He then charges \$30 per hour to fix the problem. If he estimates that the total cost will be no more than \$50, how many hours can he work and still be within his estimate?

$$5 + 30h \leq 50$$

$$\begin{array}{r} 5 + 30h \leq 50 \\ -5 \quad -5 \\ \hline \end{array}$$

$$\frac{30h}{30} \leq \frac{45}{30}$$

$$h \leq 1\frac{1}{2}$$



$$5 + 30(1) \leq 50$$

$$5 + 30 \leq 50$$

$$35 \leq 50$$

He can work $1\frac{1}{2}$ hours or less.

16. You earn \$8 per hour plus a bonus of \$10. You want to earn at least \$60. How many hours do you have to work?

$$8h + 10 \geq 60$$

$$\begin{array}{r} 8h + 10 \geq 60 \\ -10 \quad -10 \\ \hline \end{array}$$

$$\frac{8h}{8} \geq \frac{50}{8}$$

$$h \geq 6\frac{1}{4}$$



$$8(7) + 10 \geq 60$$

$$56 + 10 \geq 60$$

$$66 \geq 60$$

You have to work $6\frac{1}{4}$ hrs. or more.