

Lesson 2: The Graph of a Linear Inequality

A linear inequality is of the form $2x + 5 < 15$ and does not include an equal sign. A solution to a linear inequality is the set of numbers that satisfy the inequality. Each inequality below is followed by a list of numbers. Determine which numbers are solutions of the inequality.

a) $3x - 14 < 16$

4, 6, 10, 13

$3(4) - 14 < 16$
 $12 - 14 < 16$
 $-2 < 16$ ✓

$3(6) - 14 < 16$
 $18 - 14 < 16$
 $4 < 16$ ✓

$3(10) - 14 < 16$
 $30 - 14 < 16$
 $16 < 16$ ✗

b) $4x + 12 > 14$

1, -3, 7, 17

$4(-1) + 12 > 14$
 $8 > 14$ ✗

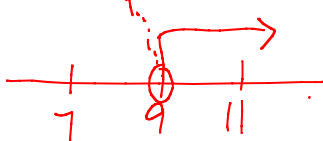
$4(-3) + 12 > 14$
 $0 > 14$ ✗

To graph a linear inequality with one variable or letter the steps are the same as solving equations but the solution must be graphed. Solve the following and graph on a number line:

1) $x - 10 > -1$

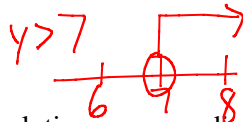
$+10$ $+10$

$x > 9$



3) $4y - 2 < 6y - 16$

$-6y + 2 - 6y + 16$
 $-2y < -14$
 -2 $\div -2$



2) $2x + 6 < 11$

and if you divide by a negative to solve you must switch the direction of the sign

$\frac{2x}{2} < \frac{5}{2}$

$x < 2.5$



4) $2(x + 2) > 3x + 1$

$2x + 4 > 3x + 1$
 -4
 $2x > 3x - 3$
 $-3x$ $-3x$

$-1x > -3$
 -1 $\div -1$
 $x < 3$

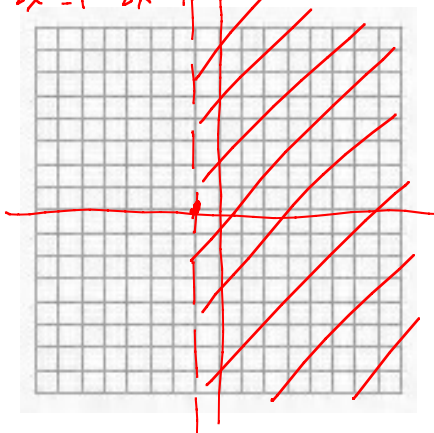


We can also graph the solution on a coordinate plane. Solve the following:

1) $3x + 1 > 2x$

$-2x - 1 - 2x - 1$

$x > -1$



2) $5x - 2 < 8$

$+2$ $+2$

$5x < 10$
 $x < 2$

