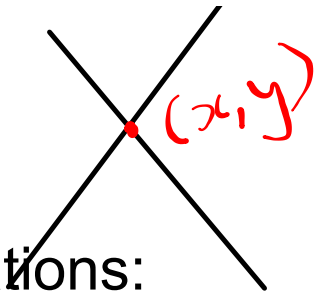
Warm Up



Solve the following system of equations:

$$7y = 3x + 8$$

$$-4x + y = -6$$

① $-3(-4x + y = -6) \Rightarrow 12x - 3y = 18$

$4(-3x + 7y = 8) \Rightarrow -12x + 28y = 32$

$25y = 50$

$y = 2$

② Plug it in: $-4x + 7 = -6$

$-4x = -8$

$x = 2$

$(2, 2)$

Check

$-3(2) + 7(2) \stackrel{?}{=} 8$

$-6 + 14 \stackrel{?}{=} 8$

$8 = 8$ ✓

Graphing Inequalities

Review
Inequality symbols:

If we think of speed limits...where x represent the speed

$x \geq 60$ or $60 \leq x$

Means the minimum speed is 60 (km/h)

We must go at least 60 (km/h)

The speed must be greater than or equal to 60 (km/h)

$x > 59$ or $59 < x$

Means the speed must be more than 59 (km/h)

The speed must be greater than 59.

59 is too low .... Anything bigger will be okay.

$x \leq 100$ or $100 \geq x$

Means the maximum speed is 100 (km/h)

at most

We must go no more than 100 (km/h)

The speed must be less than or equal to 100 (km/h)

$101 > x$ or $x < 101$

Means the speed must be less than 101 (km/h)

The speed must be smaller than 101

101 is too high ... Anything slower (smaller) is okay

First: Graph the Boundary Line

i - Graph the line as you would any equation

ii - Draw a solid boundary line if there is an equality with an equal sign:

ex. $2x + 4y \leq 12$ ————————

Any point on the line will be included in the solution set

- Draw a dotted line if there is an inequality without an equal sign:

ex. $2x + 4y < 12$ ----------

Any point on the line will NOT be included in the solution set

Second: Shade the solution set

i - Use a test point

Example: (0,0) plug the coordinates into the inequality. True of False?

NB: The test point used can NOT be on the line.

ii - Shade the side where the test point is true (solution set)

Let's look at an example...

We are going to bring Secondary 4 and Secondary 5 students to ACCESS April 25th. We can bring no more than 80 students.

x = # of Secondary 4 students

y = # of Secondary 5 students

$$x + y \leq 80$$

Helpful hints when graphing

General Form: Intercept method

x	y
0	?
?	0

Function Form: y = ax + b

y intercept

slope $\frac{\text{rise}}{\text{run}}$

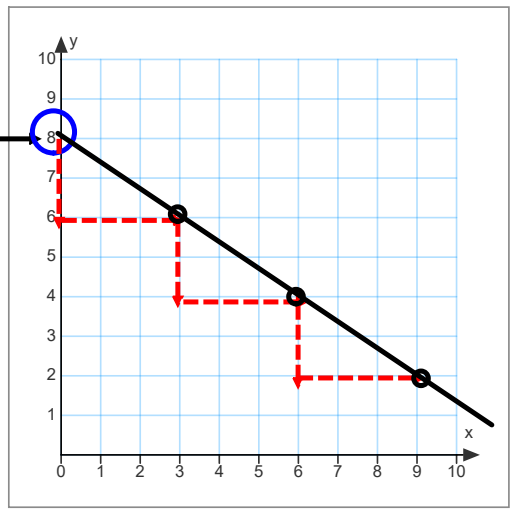
Start at the y intercept:

Ex: $y = -\frac{2}{3}x + 8$

slope

down 2

over 3



Step 1: When we graph an inequality we use the rule as if it was an equation to draw the line. (solid or dotted: check the symbol)

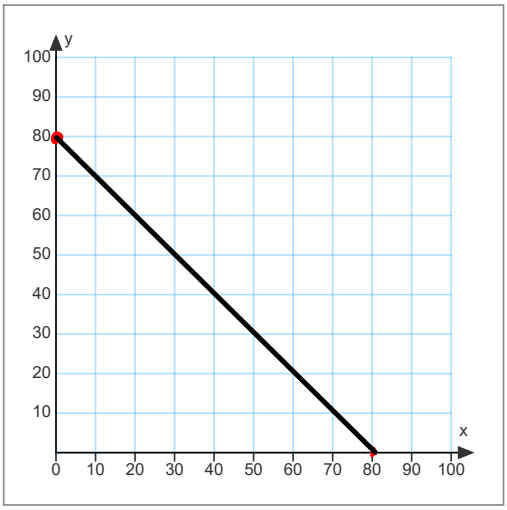
$x + y \leq 80$

Graph the line x+y=80

x	y
0	80
80	0

$0+y=80$

$x+0=80$



Step 2: Then we use the symbol to determine which side of the line represents the solutions set, ie All the possibilities.

Which side do we shade?

Graph the inequality x+y≤80 ->Solid line

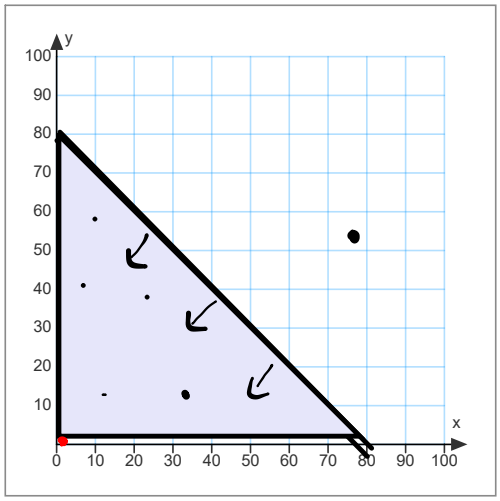
Test Point

Choose a point that is on one side (and NOT on the line) and plug the coordinates into the given rule $x + y \leq 80$

(0,0) 0+0≤80: True

It could be any point on this side

(10, 20)



10+20 is 30

30≤ 80 which is correct so we shade this side

Shade the side that makesthe inequality correct

Ex. Graph the following inequality:

$$2x+3y\geq 180$$

$$2x+3y=180$$

x	y
0	
	0

$2x+3(0)=180$

$2x=180$