

A3.8 – Sketching regions

The quickest and easiest way to graph the solution of a linear inequation, is to plot its intercepts and then draw the line passing through these points, then test a point for the required region or half-plane.

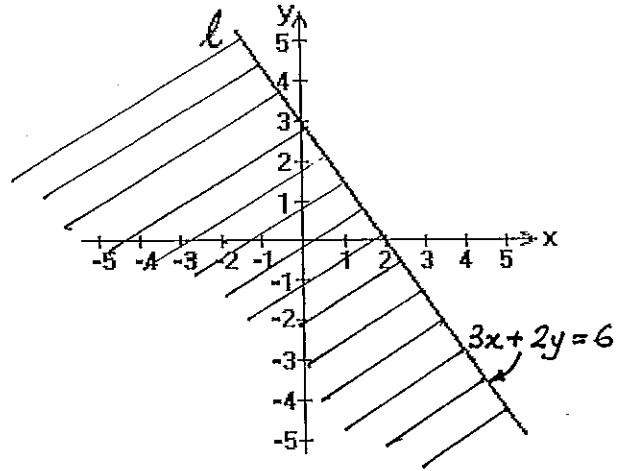
For the linear inequation: $3x + 2y \leq 6$

1st place your pen or finger over the term containing y (set $y = 0$) $3x + \cancel{2y} = 6$

- this gives you the x -intercept $x = 2$

2nd, place your pen or finger over the term containing x (set $x = 0$) $\cancel{3x} + 2y = 6$

- this gives you the y -intercept $y = 3$



3rd Then simply get your ruler and draw a line through these two points.

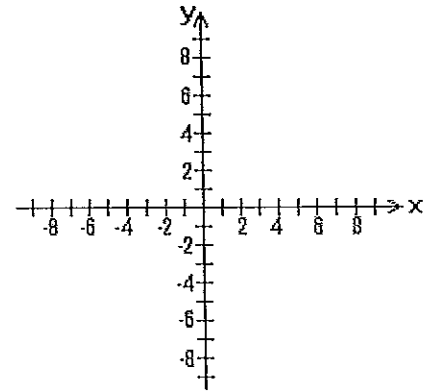
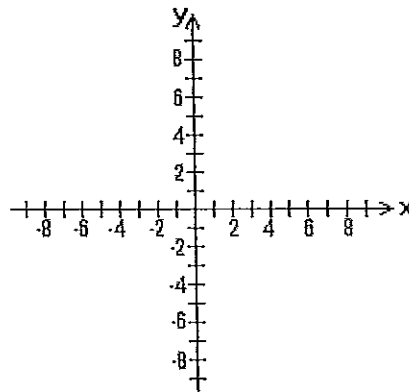
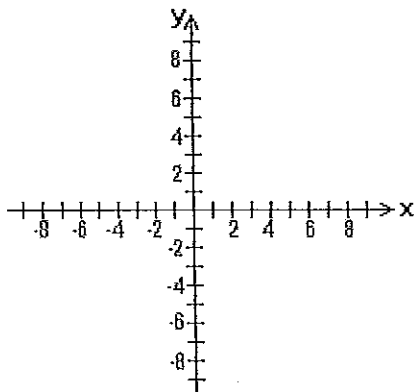
4th Now choose a convenient point, e.g. $(0,0)$ to test the inequation above i.e. $3(0) + 2(0) \leq 6$ is true, therefore shade the lower half plane.

Draw the graphs of the solutions to the following linear inequations:

(1) $2x + y \geq 8$

(2) $x + 3y \leq 6$

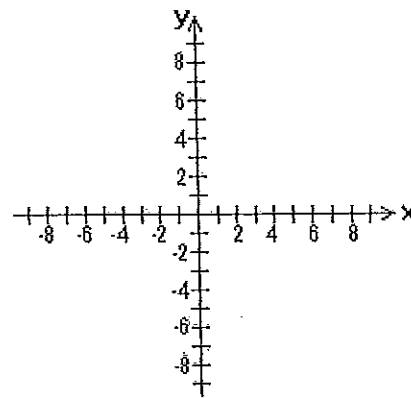
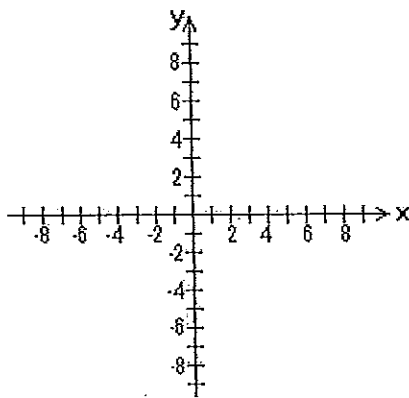
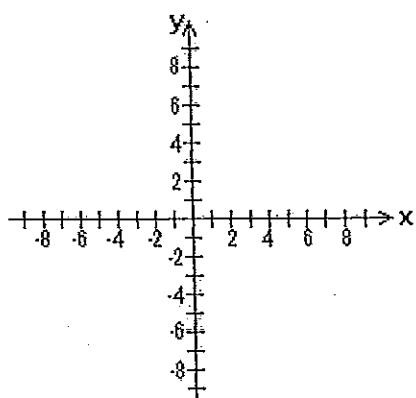
(3) $2x - y > 8$



(4) $3x - 4y < 12$

(5) $y = 2x - 5$

(6) $\frac{x}{3} - y = 2$

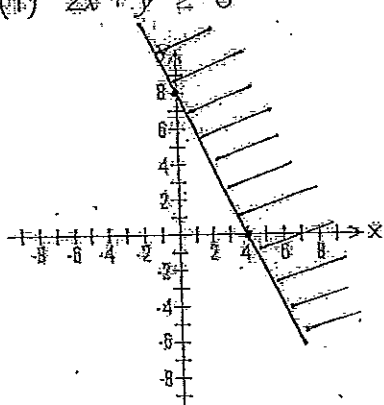


(7) Check whether the following pairs of coordinates $(1,5)$, $(5,3)$, $(-1,4)$, $(7,-2)$, $(0,5)$, $(9,5)$ would lie in the shaded region given by $x + y < 7$.

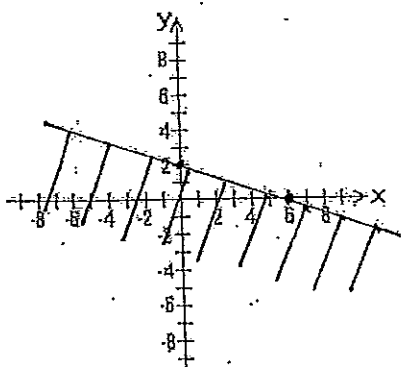
(8) Graph the regions formed by inequalities such as $x + y < 7$, $y < 2(x - 3)$ and $y \geq 0$.

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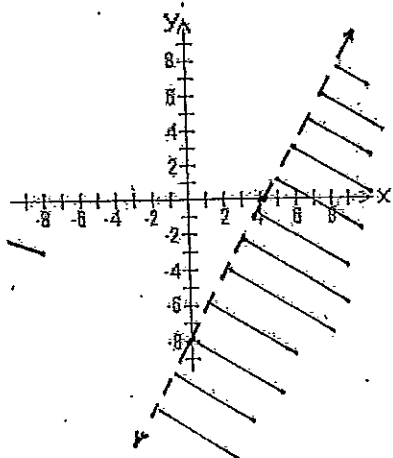
(1) $2x + y > 8$



(2) $x + 3y \leq 6$

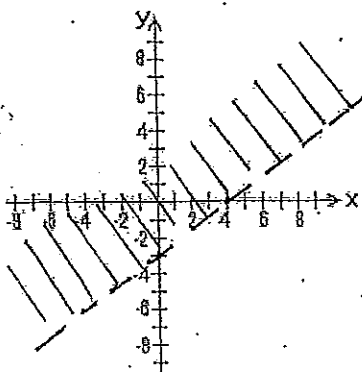


(3) $2x - y > 8$

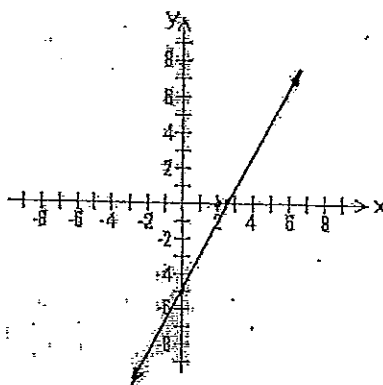


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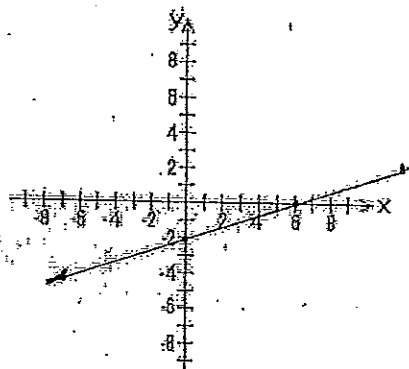
4) $3x - 4y < 12$



(5) $y = 2x - 5$



(6) $\frac{x}{3} - y = 2$



(7) Only points (5,3) and (9,5) would not lie in the region.

(8)

