Linear Inequations Ex 15.6 Q4

Consider the line $x + y = 4$. we observe that the shaded region and the origin are on the same side of the line $x + y = 4$ and $(0,0)$ satisfies the linear inequation $x + y \le 4$. So, we must have one inequations as $x + y \le 4$

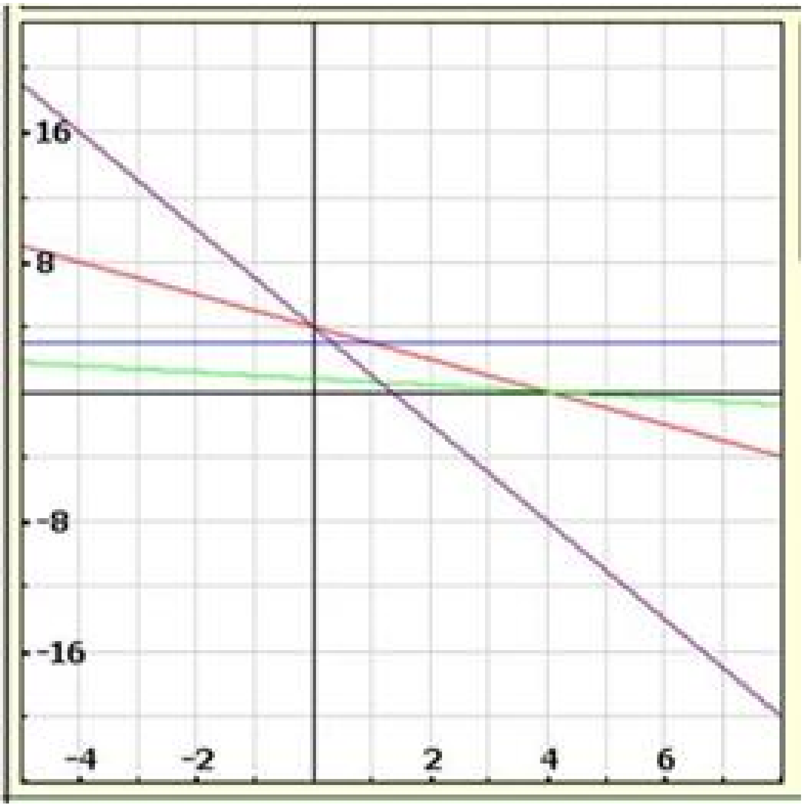
Consider the line $y = 3$. we observe that the shaded region and the origin are on the same side of the line $y = 3$ and $(0,0)$ satisfies the linear inequation $y \le 3$. so, the second inequations is $y \le 3$.

Consider the line $x = 3$.
We observe that the shaded region and the origin are on the same side of the line $x = 3$ and $(0,0)$ satisfies the linear inequation $x \le 3$. so, the third inequations is $x \le 3$.

Consider the line $x + 5y = 4$. we observe that the shaded region and the origin are on the opposite sides of the line $x + 5y = 4$ and $(0,0)$ does not satisfy the inequation $x + 5y \ge 4$. so, the fourth inequations is $x + 5y \ge 4$.

Finaly, consider the line $6x + 2y = 8$. we observe that the shaded region and the origin are on the opposite sides of the $6x + 2y = 8$ and $(0, 0)$ does not satisfy the inequation $6x + 2y = 8$. so the fifth inequations is $6x + 2y = 8$,
we also, notice that the shaded region is above x-axis and is on the right side of y-axis. so, we must have $x \ge 0$ and $y \ge 0$

Thus, the ilnear inequations corresponding to the given solution set are
$x + y \le 4$, $y \le 3$, $x \le 3$, $x + 5y \ge 4$, $6x + 2y \ge 8$, $x \ge 0$, $y \ge 0$.



Linear Inequations Ex 15.6 Q5

We have,
$x+y \le 9,\ 3x+y \ge 12,\ x \ge 0$ and $y \ge 0$

Converting the inequations into equations, we get
$x+y=9,\ 3x+y=12,\ x=0$ and $y=0.$

Region represented by $x+y \ge 9$:
Putting $x=0$ in $x+y=9$, we get $y=9$.
Putting $y=0$ in $x+y=9$, we get $x=9$.

$\therefore$ The line $x+y=9$ meets the coordinat axes at $(0,9)$ and $(9,0)$. Join these points by a thick line.

Now, putting $x=0$ and $y=0$ in $x+y \ge 9$, we get $0 \ge 9$ This is not possible.
$\therefore$ We find that $(0,0)$ is not satisfies the inequation $x+y \ge 9$.
So, the portion not containing the origin is represented by the given inequation.

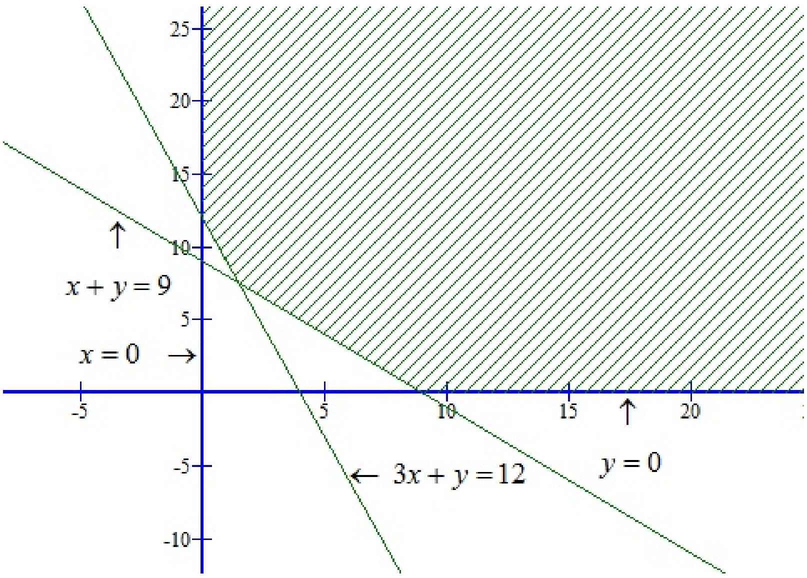
Region represented by $3x+y \ge 12$:
Putting $x=0$ in $3x+y=12$, we get $y=12$
Putting $y=0$ in $3x+y=12$, we get $x=\frac{12}{3}=4$.

$\therefore$ The line $3x+y=12$ meets the coordinate axes at $(0,12)$ and $(4,0)$. Joining these points by a thick line.
Now, putting $x=0$ and $y=0$ in $3x+y \ge 12$, we get, $0 \ge 12$

This is not possible.

$\therefore$ we find that $(0,0)$ is not satisfies the inequation $3x+y \ge 12$. so the portion not containing the origin is represented by the given inequation.

Region represented by $x \ge 0$ and $y \ge 0$: clearly, $x \ge 0$ and $y \ge 0$ represent the first quadrant.



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