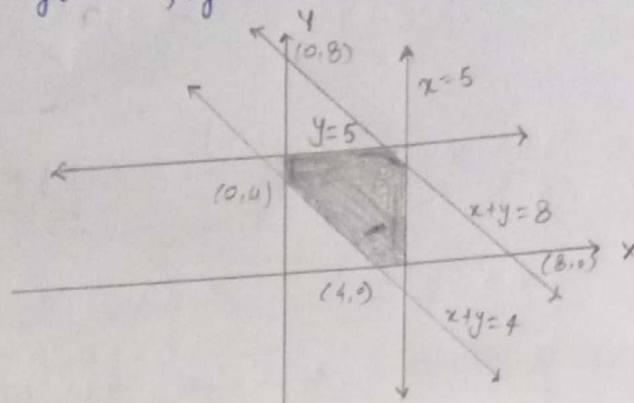


1. Find the linear inequalities for which the shaded region in the given figure is the solution set.



Sol<sup>n</sup>  $\Rightarrow$  Consider the given eq<sup>n</sup> of lines and check the side at which the origin and the shaded portion lie with respect to each line.

(1) for  $x+y=8$ ; the origin and shaded area lie on the same side of line. putting  $(0,0)$  in LHS give  $0$  which is less than  $8$  in RHS. Also there is a solid line

$$\text{So, } x+y \leq 8$$

(2) for  $x=5$ ; origin and shaded area lie of the same side of line. putting  $(0,0)$  in LHS gives  $0$  which is less than  $5$  RHS

$$\text{solid line also, gives, } x \leq 5$$

(3) for  $y=5$ , origin and shaded area lie on the same side of line. putting  $(0,0)$  in LHS gives  $0$  which is less than  $5$  RHS

$$\text{solid line also, gives, } y \leq 5$$

(4) for  $x+y=4$ , origin and shaded area lie on opposite sides of line. putting  $(0,0)$  in LHS gives  $0$  which is less than  $4$  RHS

that means inequality of the line containing the origin is

$$x+y \geq 4.$$

Therefore, the inequality of the line containing shaded area is

$$x+y \geq 4$$

(5) for first quadrant,  $x \geq 0$ ,  $y \geq 0$

Hence, inequalities representing sol<sup>n</sup> set are

$$x+y \leq 8, x \leq 5, y \leq 5, x+y \geq 4, x \geq 0, y \geq 0$$