SOLUTIONS : WORKSHEET NO: 1 (1)

← LINEAR INEQUALITIES → (solutions)

Q No. 1 →

(1) $3x + 2y \leq 150$

Points (0, 75), (50, 0)

solution $0 \leq 150$

(towards the origin)

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(2) $x + 4y \leq 80$

Points (0, 20) (80, 0)

solution $0 \leq 180$

(towards origin)

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(3) $x \leq 15$

line parallel to Y-axis

solution $0 \leq 15$

towards the origin

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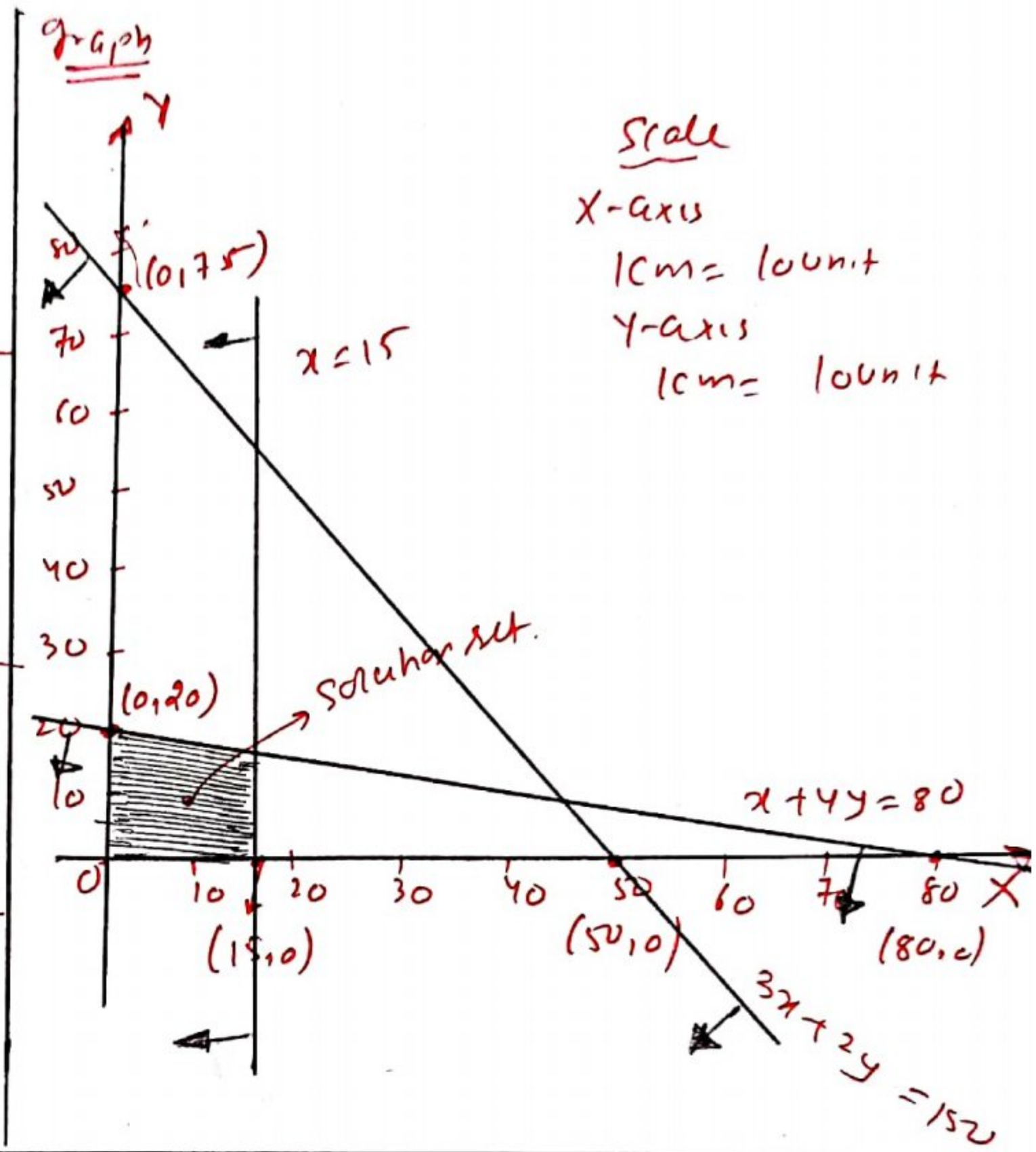
(4) $x \geq 0, y \geq 0$

Ist quadrant

graph



Scale

X-axis

1cm = 10 unit

Y-axis

1cm = 10 unit

Q No. 2 →

(1) $4x + 3y \leq 60$

Point (0, 20) (15, 0)

solution $0 \leq 60$

(towards origin)

(2) $y \geq 2x$

(0, 0) (3, 6)

solution: towards Y-axis

(3) $x \geq 3$

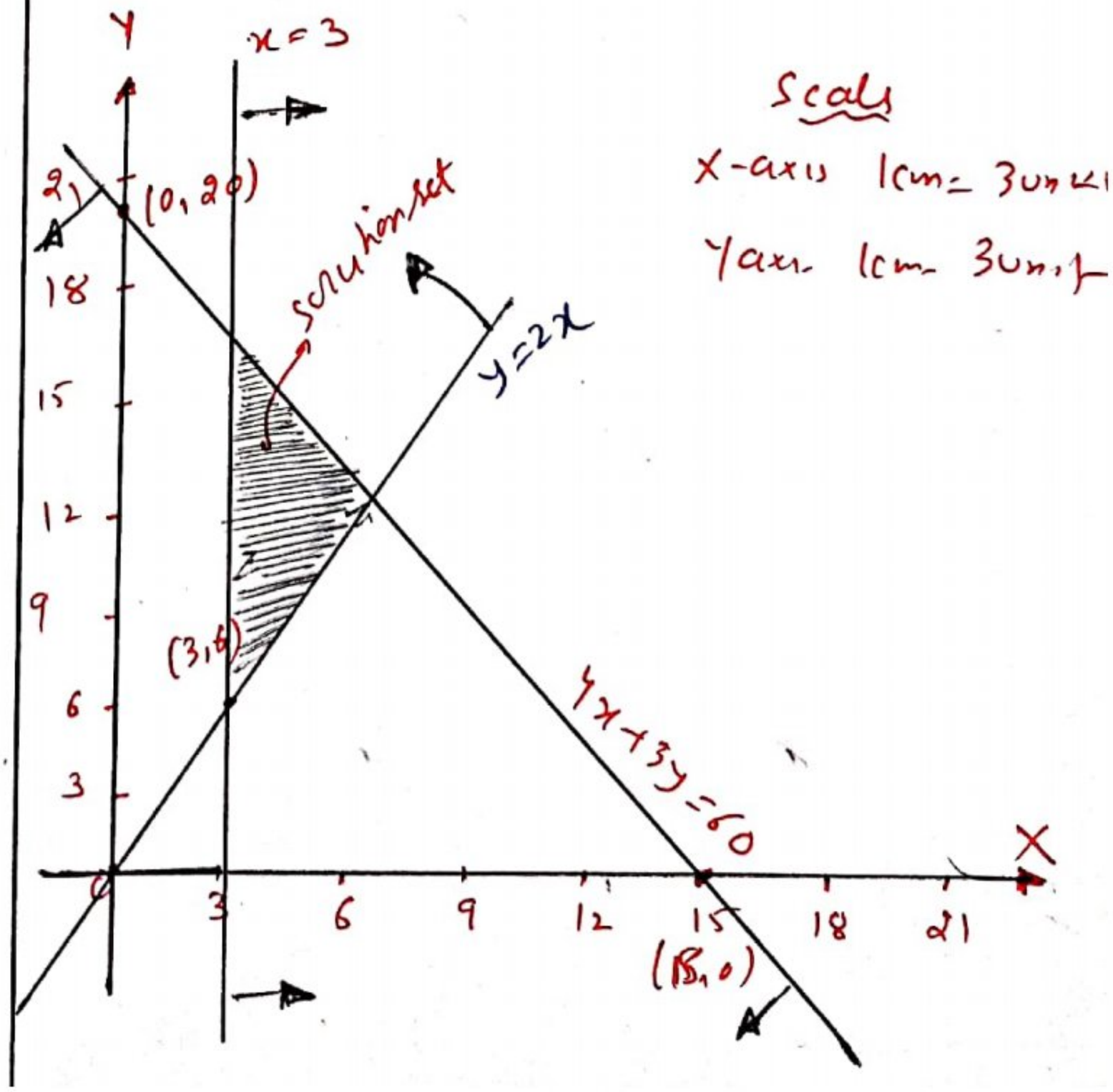
line parallel to Y-axis

solution $0 \geq 3$

(away from origin)

(4) $x, y \geq 0$

Ist quadrant



Scale

X-axis 1cm = 3 unit

Y-axis 1cm = 3 unit

Q No: 3 →

① $2x+y \geq 4$

Points (0,4) (2,0)

Solution $0 \geq 4$

(away from origin)

② $x+y \leq 3$

Point (0,3) (3,0)

Solution $0 \leq 3$

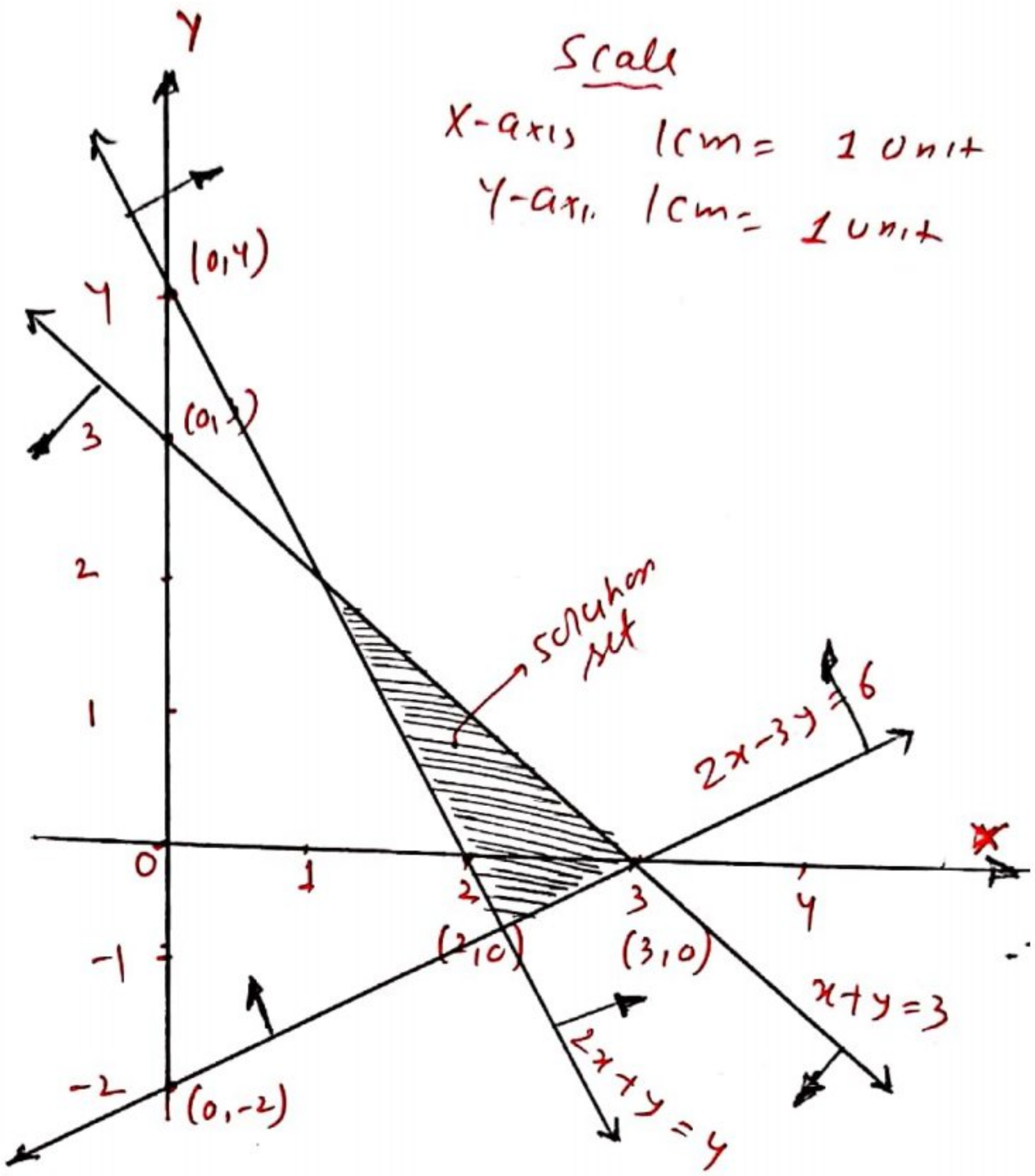
(towards origin)

③ $2x-3y \leq 6$

Point (0,-2) (3,0)

Solution $0 \leq 6$

(towards origin)



Scale

X-axis: 1cm = 1 unit

Y-axis 1cm = 1 unit

Q No: 4 →

① $5x+4y \leq 20$

Point (0,5) (4,0)

Solution $0 \leq 20$

(towards origin)

② $x \geq 1$

Line parallel to y-axis

Solution $0 \geq 1$

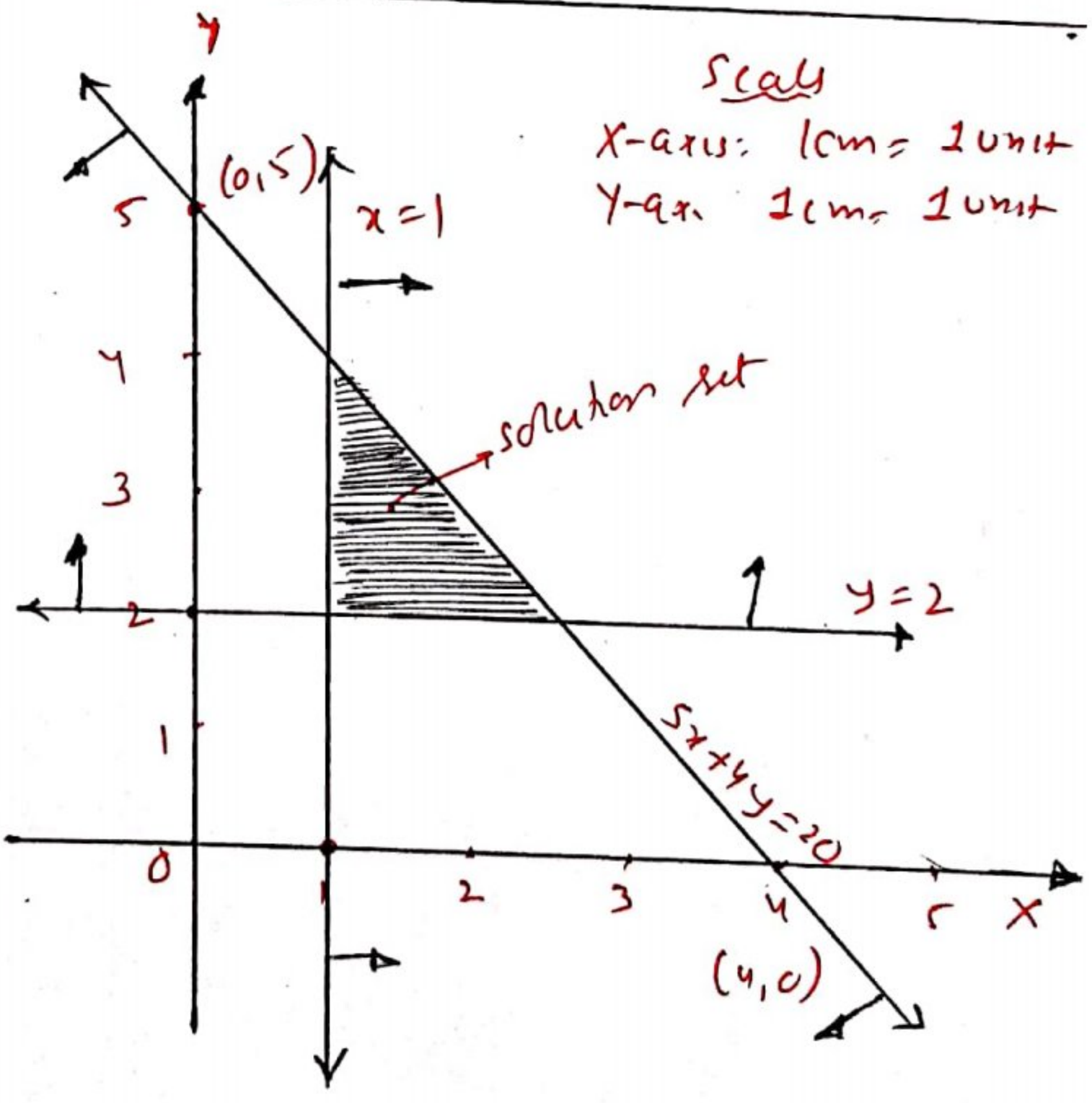
(away from origin)

③ $y \geq 2$

Line parallel X-axis

(Solution $0 \geq 2$

away from origin



Scale

X-axis: 1cm = 1 unit

Y-axis 1cm = 1 unit

Q No 5 →

(1) $x+y \leq 4$

Point (0,4) & (4,0)

(Solution towards origin)

(2) $y \leq 3$

line parallel to X-axis

(Soln - towards the origin)

(3) $x \leq 3$

line parallel to Y-axis

(Soln - towards origin)

(4) $x+5y \geq 4$

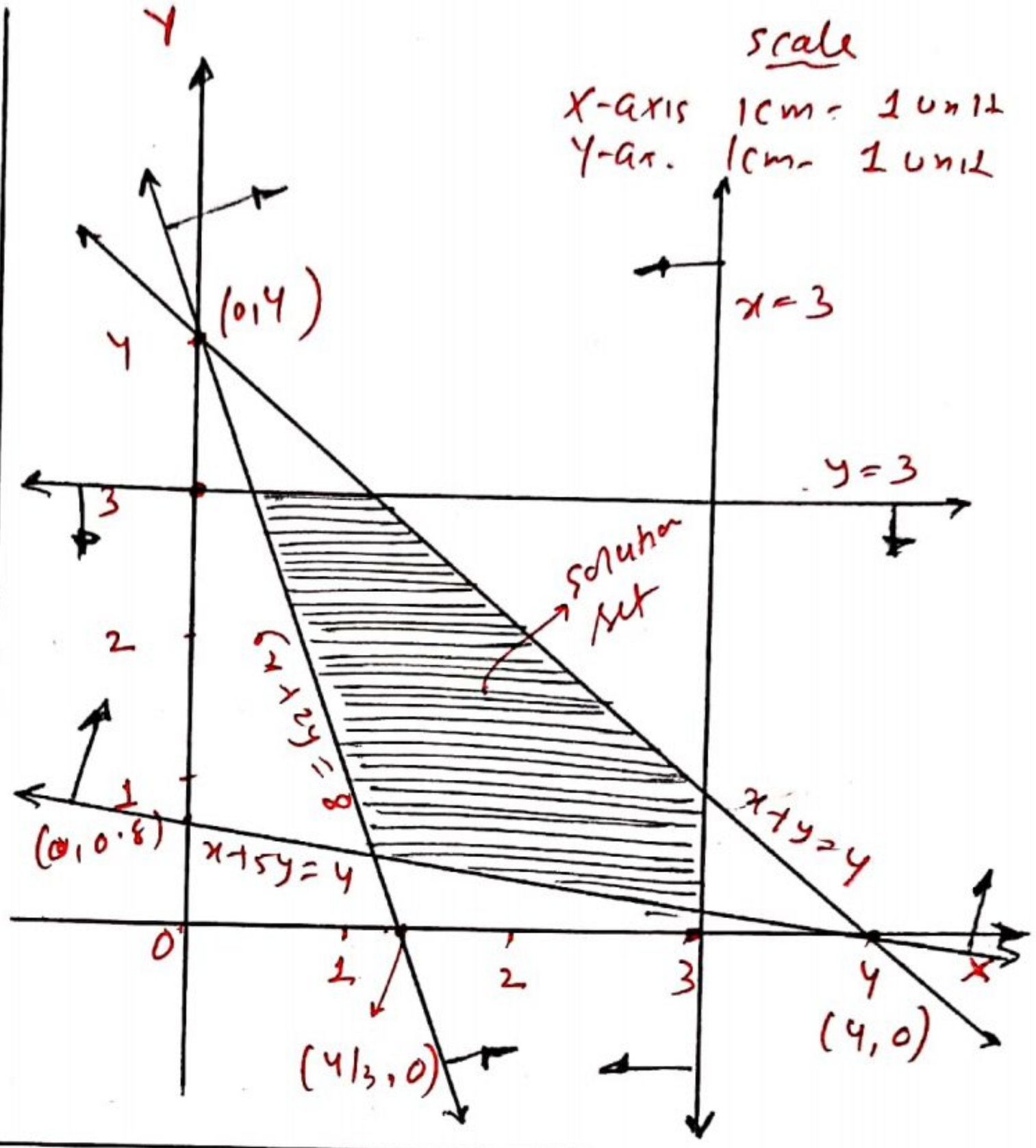
(0, 0.8) (4, 0)

(Soln away from origin)

(5) $6x+2y \geq 8$

Point (0,4) (4/3, 0)

(away from origin)



Q No 6 →

(1) $2x+3y \geq 6$

(0, 2) (3, 0)

Soln away from origin

(2) $4x+6y \leq 24$

(0, 4) (6, 0)

Soln towards origin

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

(0, 3/2) (-1, 0)

soln towards origin

(4) $x-2y \leq 2$

(0, -1) (2, 0)

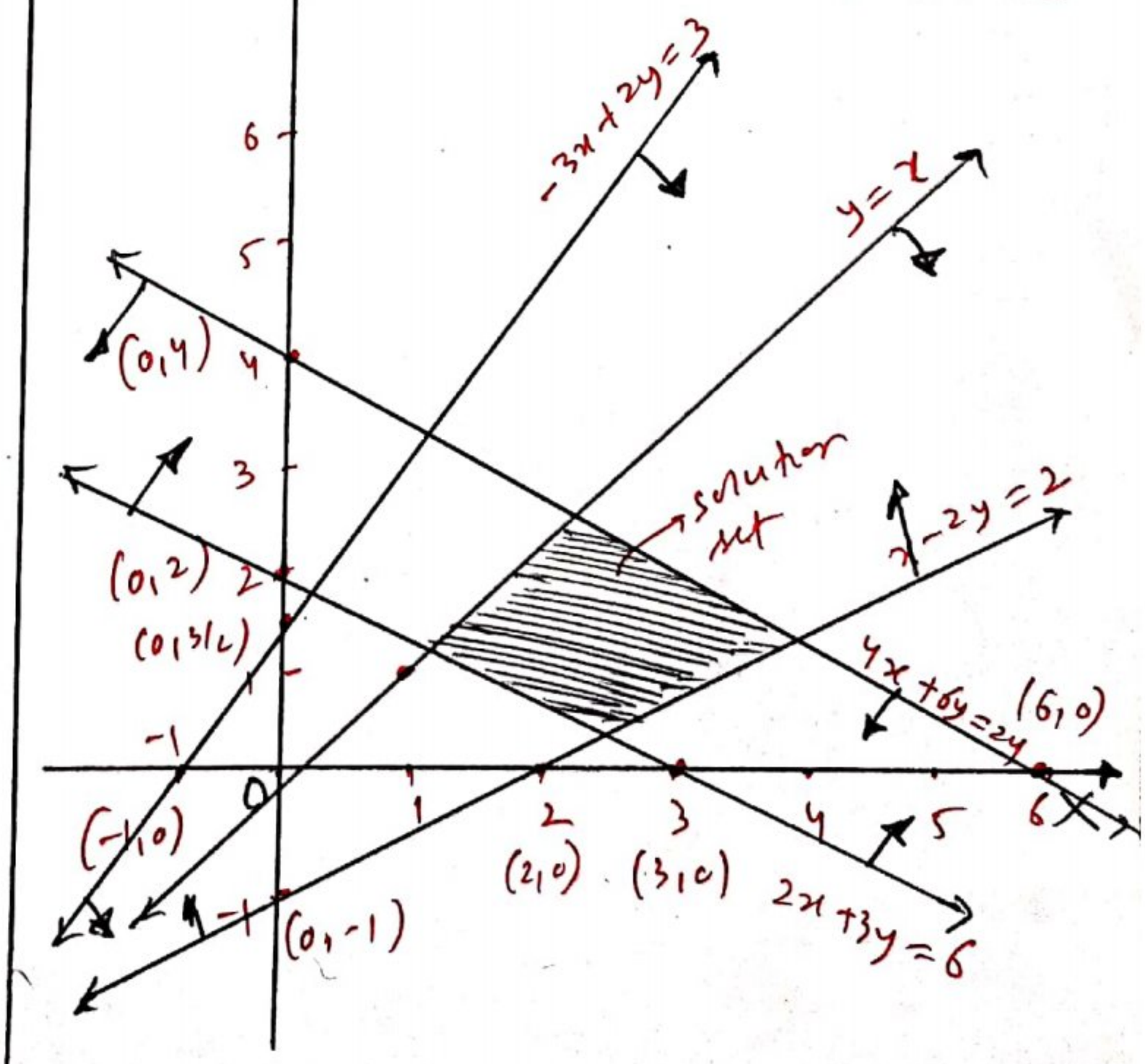
soln : towards origin

(5) $x \geq y$

(0, 0) (1, 1)

towards X-axis

1st quadrant



Solution (W.S = I) Linear

Q.No 7 ① $2x+3y \geq 3$

$(0, 1)$ $(3k, 0)$

Soln ⟹ away from origin

② $3x+4y \leq 18$

$(0, \frac{9}{2})$ $(6, 0)$

Soln ⟹ towards origin

③ $-7x+4y \leq 14$

$(0, 7/2)$ $(-2, 0)$

Soln ⟹ towards origin

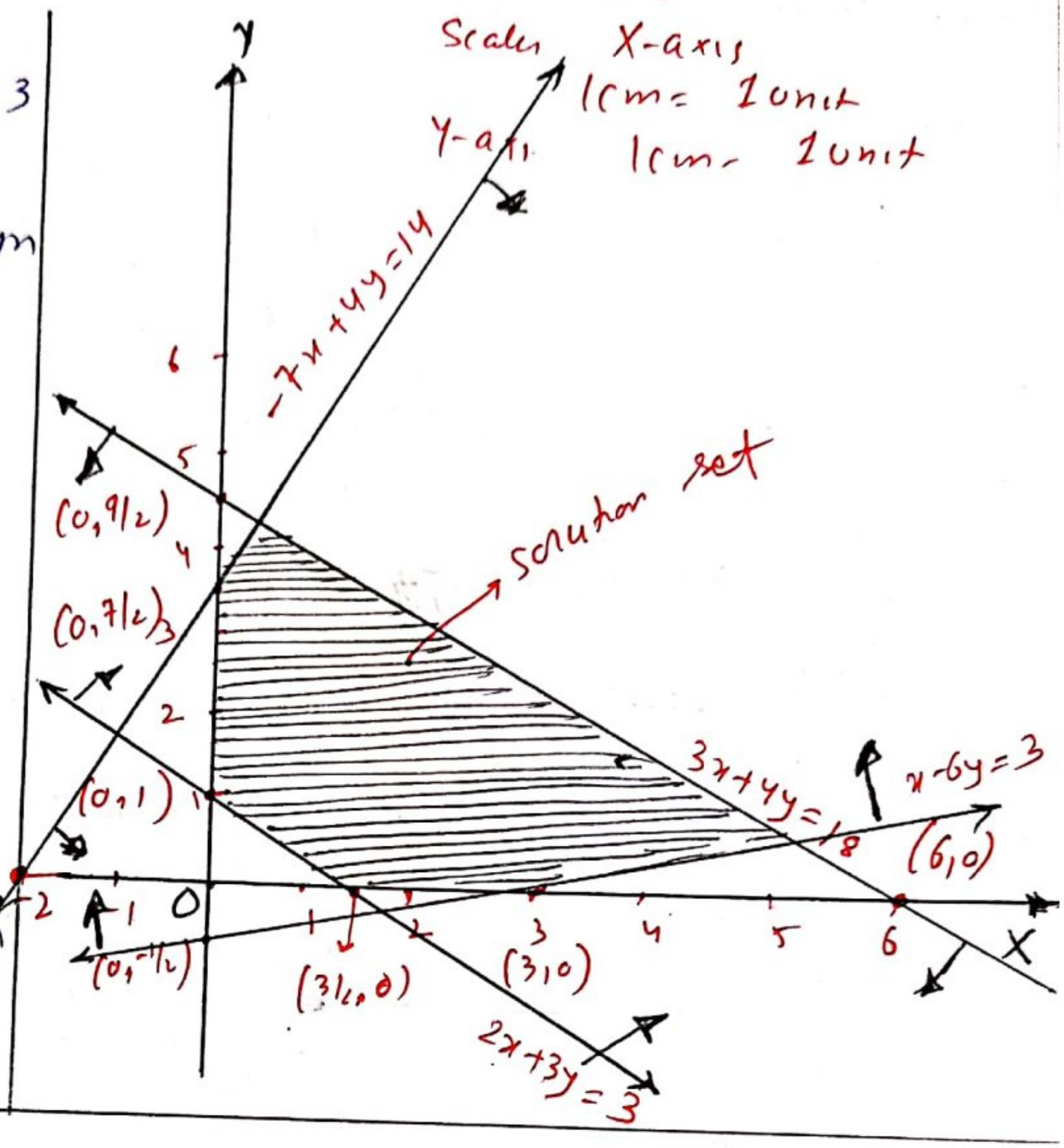
④ $x-6y \leq 3$

$(0, -1/2)$ $(3, 0)$

Soln ⟹ towards origin

⑤ $x, y \geq 0$

Ist quadrant



Q.No 8 ⟹

$$\frac{x+5}{3} - 2 \leq \frac{3x-1}{4} + 1$$

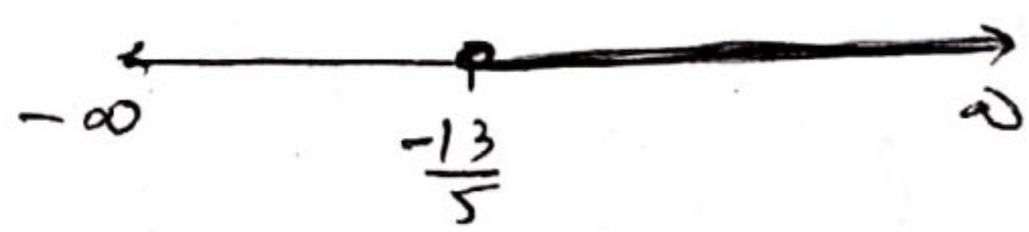
$$\Rightarrow \frac{x-1}{3} \leq \frac{3x+3}{4}$$

$$\Rightarrow 4x-4 \leq 9x+9$$

$$\Rightarrow -5x \leq 13$$

$$\Rightarrow x \geq \frac{-13}{5}$$

$$\therefore x \in \left[\frac{-13}{5}, \infty\right)$$



Q.No 9 ⟹

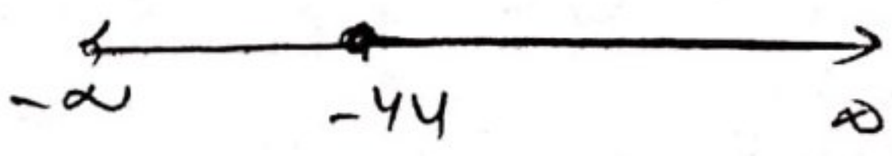
$$\frac{2(x-1)}{5} \leq 3\frac{(2+x)}{7}$$

$$\Rightarrow \frac{2x-2}{5} \leq \frac{6+3x}{7}$$

$$\Rightarrow 14x-14 \leq 30+15x$$

$$\Rightarrow -x \leq 44$$

$$\Rightarrow x \geq -44$$



Q.No 10 →

$$\frac{2x-1}{3} \geq \frac{3x-2}{4} - \frac{(2-x)}{5}$$

$$\Rightarrow \frac{2x-1}{3} \geq \frac{15x-10-8+4x}{20}$$

$$\Rightarrow \frac{2x-1}{3} \geq \frac{19x-18}{20}$$

$$\Rightarrow 40x-20 \geq 57x-54$$

$$\Rightarrow 40x-20 \geq 57x-54$$

$$\Rightarrow -17x \geq -34$$

$$\Rightarrow x \leq 2$$

—x—