2. Linear inequalities

1. $\frac{12 \times 0.25 - 12.4 \div 0.4 \times 3}{\frac{1}{8} \text{ of } 2.56 + 8.68}$

$\frac{3 - 31 \times 3}{0.32 + 8.68}$

$\frac{-90}{9}$

$= -10$

2. $x - 9 \leq -4 < 3x - 4$

$x - 9 \leq -4$

$x \leq 5$

$3x - 4 > -4$

$3x > 0$

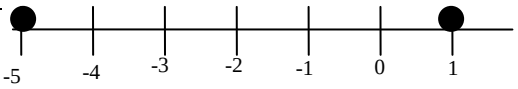
$x = 0$

$0 > x \leq 5$ ✓

$\{1, 2, 3, 4, 5\}$ ✓

3. $x > 3 - 2x$

$x \leq \frac{2x + 5}{3}$



$3 - 2x < x$

$-2x < x - 3$

$-3x < -3$

$x < 1$

$2x + 5 \geq 3x$

$-x \geq 5$

$x \leq -5$

$-5 \leq x < 1$

4. $3 - X \leq 1 - \frac{1}{2} X$

$3 - 1 \leq X - \frac{1}{2} X$

$2 \leq \frac{1}{2} X$

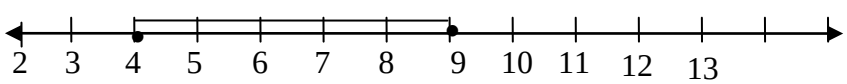
$X \geq 4$

$-x + 5 \leq 14 - 2x$

$2x - x \leq 14 - 5$

$x \leq 9$

$4 \leq X \leq 9$



5. $4x - 3 \leq 6x - 1$

$-2x \leq 2$

$x \geq -1$

$6x - 1 < 3x + 8$

$3x < 9$

$x < 3$

$-1 \leq x < 3$

6. $2(2-x) < 4x - 9$

$4 - 2n < 4x - 9$

$4 + 9 < 4x + 2n = 13\ 6x$

$= {}^{13}/_{6} < n$ $= 2{}^{1}/_{6} < n$

and $4x - 9 < x + 11$

$4n - n < 11 + 9$

$3n < 20$

$x < {}^{20}/_{3} = < {}^{2}/_{3}$

Integral values 3, 4, 5, 6

7. $L_3 : y \geq 1$

$L_1 : y + x \geq -1$

$L_2 : y - x$

8. a) $x^2 + 2xy + y^2 = x^2 + xy + xy + y^2$

$= x(x + y) + y(x + y)$

$= (x + y)(x + y)$

$\therefore (x + y)^2 = 8 \times 8 = 64$

b) $x^2 + 2xy + y^2 = 64$

$(x^2 + y^2) + 2xy = 64$

$34 + 2xy = 64$

$2xy = 30$

9. Equation of L1

(3.5, 4) (0, 2)

$\frac{y-2}{x-0} = \frac{2}{3.5-0}$

$3.5y - 7 = 2x$

$\therefore y = {}^{4}/_{7}x = 2x$

Inequality of

$y \leq {}^{4}/_{7}x + 2$

Or $7y\ 4x + 14$

Equation of L2

(0, 3) (4, 2)

$\frac{y-2}{x-4} = \frac{3-2}{0-4}$

$-4(y-2) = x-4$

$-4y + 8 = x - 4$

$-4y = x - 12$

inequality $y \geq -\frac{1}{4}x + 3$

$4y \geq -x + 12$

Equation of L3

$\frac{y-2}{x-4} = \frac{2}{-0.5}$

$-0.5(y-2) = 2(x-4)$

$-5y + 1 = 2x - 8$

$-5y = 2x - 9$

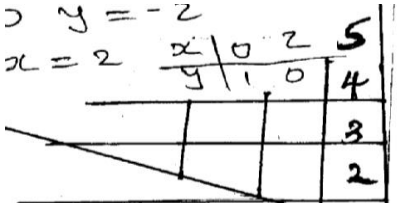
$y = -4x + 18$

in equality $y \leq -4x + 18$

10. Lines to be drawn $x = 0$, $y = 2$

$2y + x = 2$

x	0	2
y	1	0



11. $3(1 + x) < 5x - 11$

$3 + 3x) < 5x - 11$

$-2x < -14$

$x > 7$

$5x - 11 < 45$

$5x < 56$

$x < 11.2$

Integral values are 8, 9, 10, 11

12. $y \leqslant x$

$x \leqslant 8$

$y \geqslant 0$