

INEQUALITIES

Form 5

Vol 1

Part 3 – Statement Problems

1. False
2. True
3. False
4. False
5. False
6. True
7. False
8. True

Part 4 – New Range Problems

1.
 $\therefore -3 < x < 5$
 $\therefore -9 < 3x < 15$
 $-27 < 3x - 18 < -3$
 $-27 < 2y < -3$
 $-\frac{27}{2} < y < -\frac{3}{2}$

The required range of y : $-\frac{27}{2} < y < -\frac{3}{2}$

2.

$$\therefore 5x - 8y = x + 9$$

$$\therefore x = \frac{8y + 9}{4}$$

$$\therefore x = \frac{8y + 9}{4} \text{ and } -10 < x < -2$$

$$\therefore -10 < \frac{8y + 9}{4} < -2$$

$$-40 < 8y + 9 < -8$$

$$-49 < 8y < -17$$

$$-\frac{49}{8} < y < -\frac{17}{8}$$

The required range of y : $-\frac{49}{8} < y < -\frac{17}{8}$

3.

$$\therefore -4 < x < -1$$

$$\therefore 1 < x^2 < 16$$

$$-48 < -3x^2 < -3$$

$$-58 < -3x^2 - 10 < -13$$

$$-58 < y < -13$$

The required range of y : $-58 < y < -13$

4.

$$\therefore -2 < x < 3$$

$$\therefore 0 \leq x^2 < 9$$

$$-108 < -12x^2 \leq 0$$

$$-101 < -12x^2 + 7 \leq 7$$

$$-101 < 4y \leq 7$$

$$-\frac{101}{4} < y \leq \frac{7}{4}$$

The required range of y : $-\frac{101}{4} < y \leq \frac{7}{4}$

5.

$$\therefore 2 < x < 4$$

$$\therefore \frac{1}{4} < \frac{1}{x} < \frac{1}{2}$$

$$-2 < -\frac{4}{x} < -1$$

$$1 < 3 - \frac{4}{x} < 2$$

$$1 < 2y < 2$$

$$\frac{1}{2} < y < 1$$

The required range of y : $\frac{1}{2} < y < 1$

6.

$$\therefore -3 < x < 5$$

$$\therefore 0 < x+3 < 8$$

$$\frac{1}{x+3} > \frac{1}{8}$$

$$\frac{2}{x+3} > \frac{1}{4}$$

$$\frac{2}{x+3} - 20 > \frac{1}{4} - 20$$

$$-5y > -\frac{79}{4}$$

$$y < \frac{79}{20}$$

The required range of y : $y < \frac{79}{20}$