

Inequalities

Q1. Find the value of the unknown quantities from the following inequalities and draw the number line to represent their values.

$$-4 < n \leq 1$$

n is an integer.

(a) Write down all the possible values of n .

.....

(b) Solve $3x - 2 > x + 7$

.....

Q2. From the number line below, write all possible values of the unknown quantities.

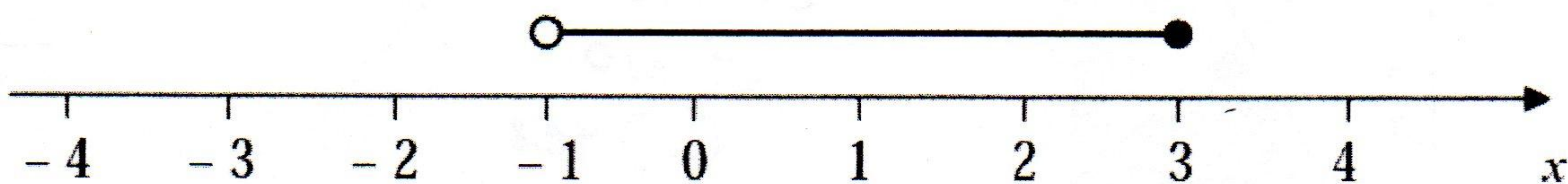
$$-3 \leq n < 2$$

n is an integer.

(a) Write down all the possible values of n .

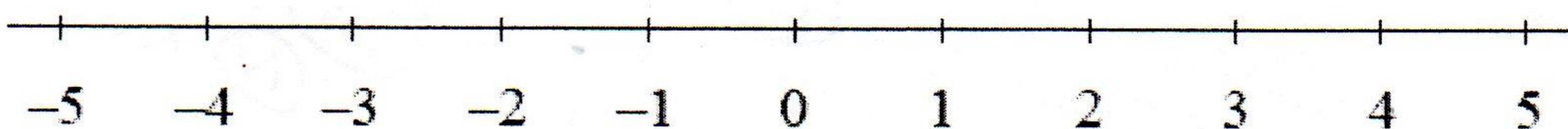
.....

(b) Write down the inequalities represented on the number line.



.....

Q3. $x < -2$ Show this inequality on the number line.



Q4. Solve the following inequality.

$$7n - 1 < 3n + 5$$

Draw diagrams to illustrate the following.

Q : a) $x > -2$

b) $2 < x \leq 5$

Q5. On the same grid, draw the regions defined by these inequalities.

i $-3 < x < 6$ **ii** $-4 \leq y \leq 5$

b Are the following points in the region defined by both inequalities?

i (2, 2) **ii** (1, 5) **iii** (-2, -4)

Q6 . a Draw the line $y = 2x - 1$ (as a dashed line).

b Shade the region defined by $y \leq 2x - 1$.

Q7 . a Draw the line $3x - 4y = 12$ (as a solid line).

b Shade the region defined by $3x - 4y \leq 12$.

Q8 . a Draw the line $y = \frac{1}{2}x + 3$ (as a solid line).

b Shade the region defined by $y \leq \frac{1}{2}x + 3$.

Shade the region defined by $y \leq -3$.

Q9 . a Draw the line $y = 3x - 4$ (as a solid line).

b Draw the line $x + y = 10$ (as a solid line) on the same diagram.

c Shade the diagram so that the region defined by $y \geq 3x - 4$ is left *unshaded*.

d Shade the diagram so that the region defined by $x + y \geq 10$ is left *unshaded*.

e Are the following points in the region defined by both inequalities?

i (2, 1) **ii** (2, 2) **iii** (2, 3)

Q10 . a Draw the line $y = x$ (as a solid line).

b Draw the line $2x + 5y = 10$ (as a solid line) on the same diagram.

c Draw the line $2x + y = 6$ (as a dashed line) on the same diagram.

d Shade the diagram so that the region defined by $y < x$ is left *unshaded*.

e Shade the diagram so that the region defined by $2x + 5y \leq 10$ is left *unshaded*.

f Shade the diagram so that the region defined by $2x + y \leq 6$ is left *unshaded*.

g Are the following points in the region defined by these inequalities?

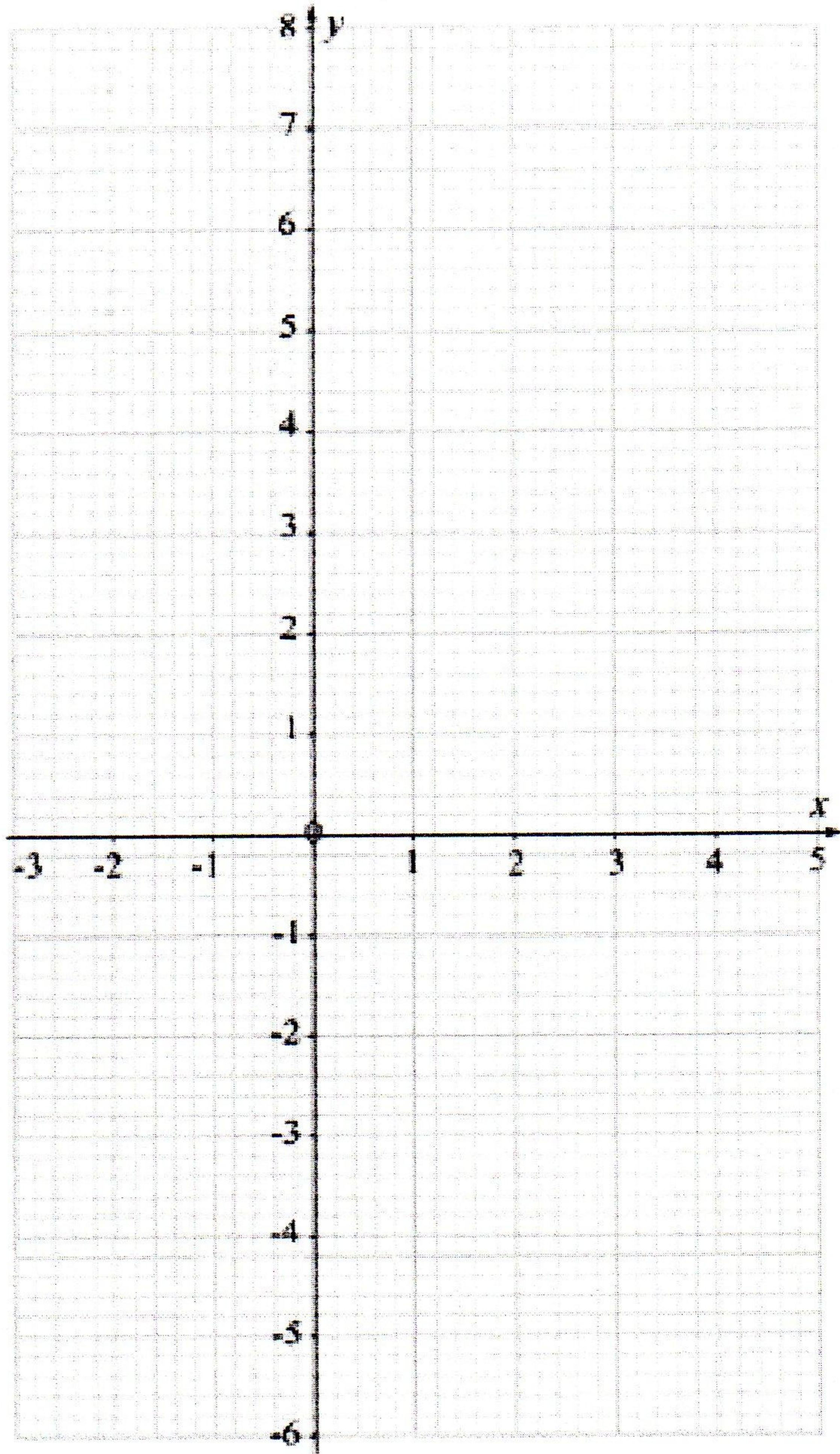
i (1, 1) **ii** (2, 2) **iii** (1, 3)

Q11. Plot the graph of the following inequalities. Shade the region which satisfies all three.

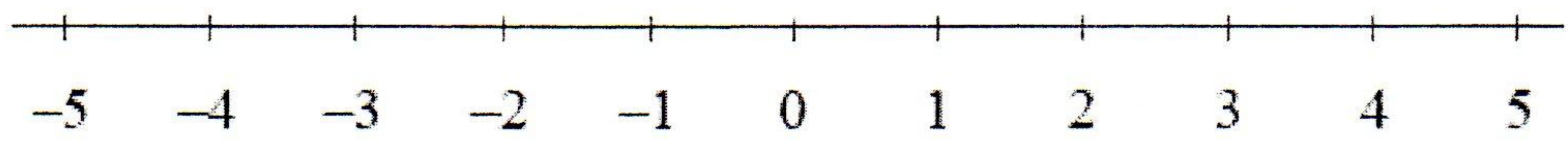
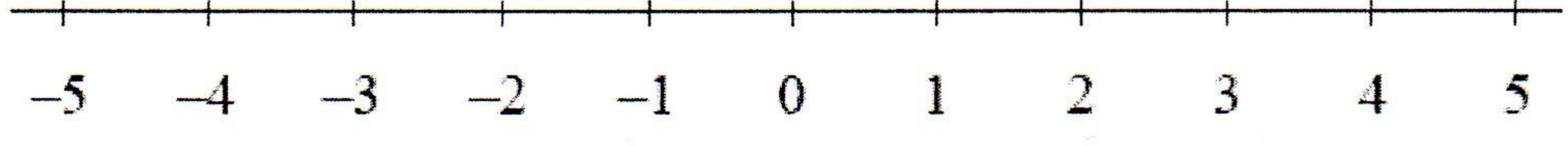
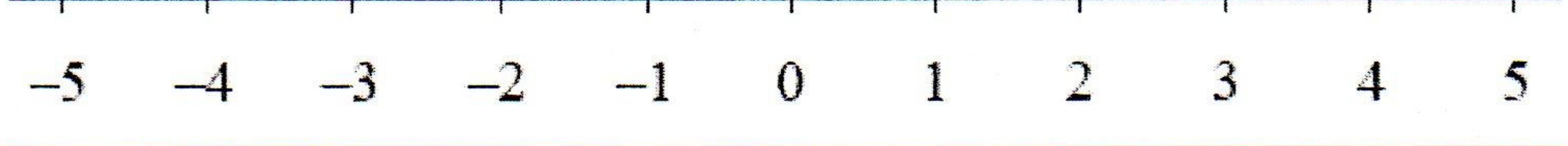
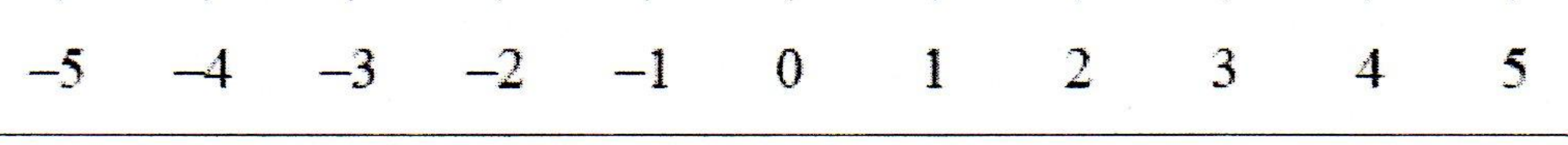
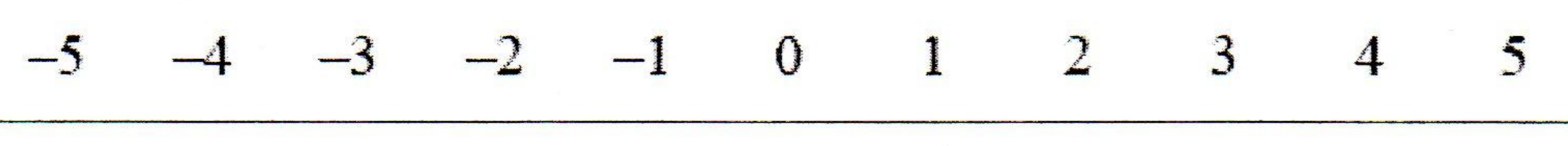
$$y \leq 3x + 2$$

$$y > 3$$

$$y \leq 7 - 2x$$



Q12. Solve the following inequalities, showing their solutions on number lines.

Q.N.	Inequality	Number Line
a)	$x^2 \leq 4$	
b)	$x^2 \geq 9$	
c)	$x^2 - 3 \leq 13$	
d)	$2x^2 - 1 < 7$	
e)	$3x^2 - 5 \leq 22$	

Q13. On the same grid, draw the regions defined by the following inequalities.
(Shade the diagram so that the overlapping region is left blank.)

i $y \leq x - 3$

ii $3y + 4x \leq 24$

iii $x < 2$

b Are the following points in the region defined by all three inequalities?

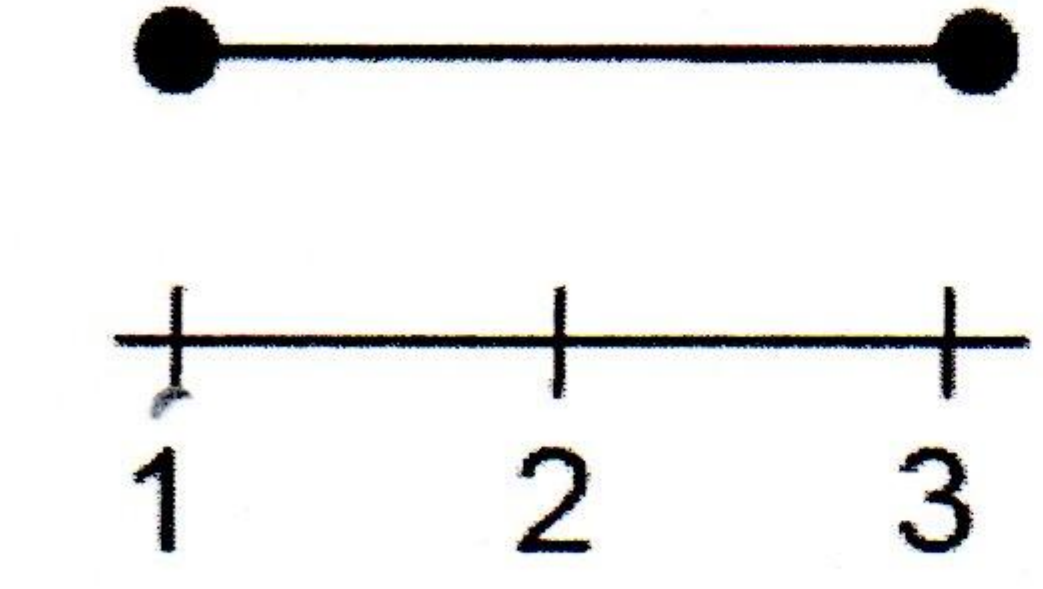
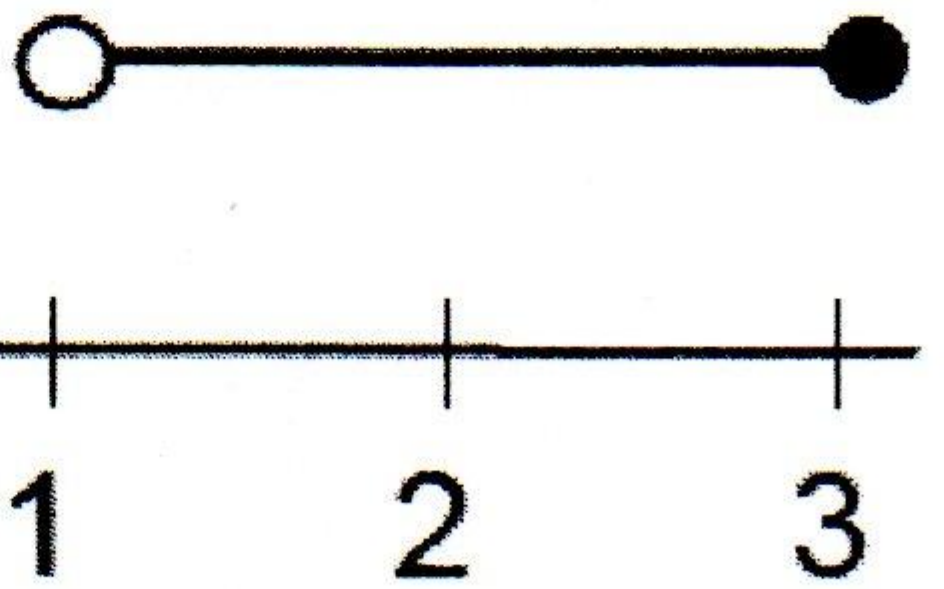
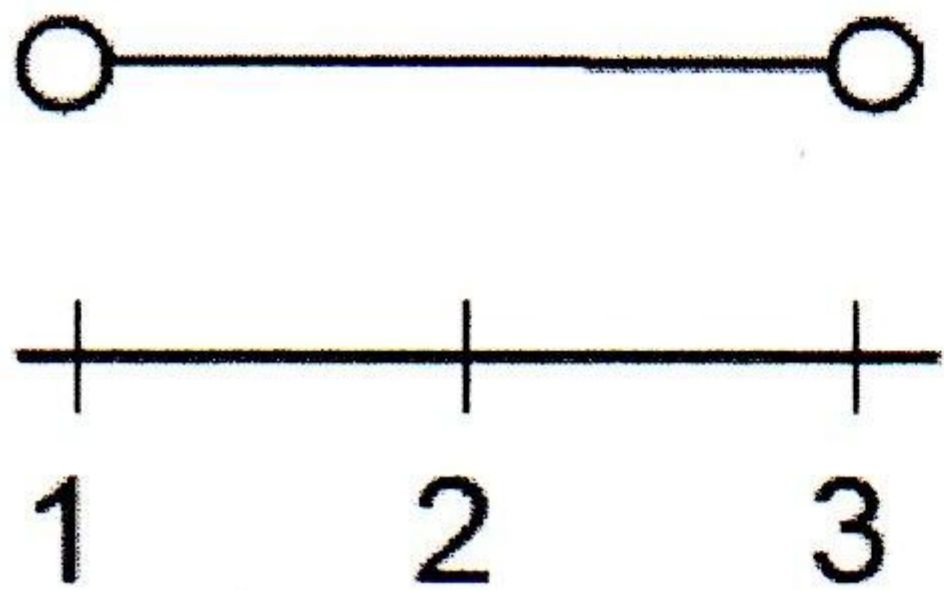
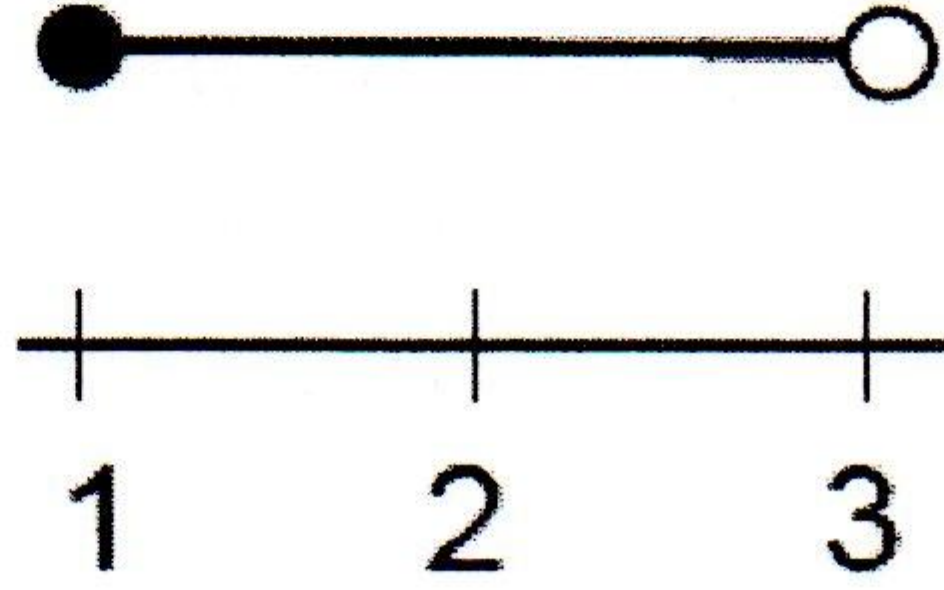
i (1, 1)

ii (2, 2)

iii (3, 3)

iv (4, 4)

Q14. Write the inequality represented by the following number line.

Q15. Points in the shaded region satisfy **three** of these inequalities. A

- A $y \leq x$
- B $y \geq 2x + 4$
- C $3x + 2y \leq 24$
- D $3x + 2y \geq 24$
- E $y \geq x$
- F $y - 4 \leq 2x$

Three inequalities identify the shaded region on this diagram.
Write down the inequalities of all three lines.

$y = 1 - 2x$ corresponding inequality

$x = 3$ corresponding inequality

$y = x + 1$ corresponding inequality

