2. LINEAR INEQUALITIES

1. (D) a – c > b + c

2. (D) $\frac{x}{z} < \frac{y}{z}$

3. (C) half-plane that neither contains the origin nor the points on the line 2x + 3y = 6

4. (B) $x \in (-1, \infty)$

5. (B) $\frac{k-p}{m} \leq 4$

6. (B) $(-\infty, -1) \cup \left(\frac{1}{3}, \infty\right)$

7. (B) $x \in (-\infty, -2)$

8. (D) <

9. (B) $x \in (-1, \infty)$

10. (C) Assertion (A) is true, but Reason (R) is false.

11. (A) $x + y > 2\sqrt{xy}$

12. Solution

Obviously $\sqrt{6} + \sqrt{5} > \sqrt{3} + \sqrt{2} \Rightarrow \frac{(\sqrt{6}+\sqrt{5})(\sqrt{6}-\sqrt{5})}{(\sqrt{6}-\sqrt{5})} > \frac{(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})}{(\sqrt{3}-\sqrt{2})}$	½
$\Rightarrow \frac{6-5}{(\sqrt{6}-\sqrt{5})} > \frac{3-2}{(\sqrt{3}-\sqrt{2})} \Rightarrow \frac{1}{(\sqrt{6}-\sqrt{5})} > \frac{1}{(\sqrt{3}-\sqrt{2})}$	1
$\Rightarrow \sqrt{6} - \sqrt{5} < \sqrt{3} - \sqrt{2} \Rightarrow \sqrt{5} + \sqrt{3} > \sqrt{6} + \sqrt{2}$	½

13. Solution

Ans.	$-\frac{2}{3} < -\frac{x}{3} + 1 \leq \frac{2}{3}$	
	$\Rightarrow -\frac{5}{3} < -\frac{x}{3} \leq -\frac{1}{3}$	
	$\Rightarrow \frac{1}{3} \leq \frac{x}{3} < \frac{5}{3}$	1
	$\Rightarrow 1 \leq x < 5$	1
	Solution set is $[1, 5)$	

14. Solution

Ans.	$\frac{3}{5}x - \frac{2x-1}{3} > 1$	
	$\Rightarrow 9x - 5(2x-1) > 15$	1
	Solving we get, $x < -10$	½
	Solution set is $\emptyset$	½

15. Solution

Sol.	$\frac{x+3}{x-2} - 2 \leq 0 \Rightarrow \frac{-x+7}{x-2} \leq 0$ or $\frac{x-7}{x-2} \geq 0$	(1)
	Thus, the solution set is $(-\infty, 2) \cup [7, \infty)$	(1)

16. Solution

Ans	$3x+8>2 \Rightarrow x>-2$	
	(i) solution set $=\{-1,0,1,2,3,...\}$	1
	(ii) solution set $=\{1,2,3,...\}$	1
	(iii) solution set $=\{0,1,2,3,...\}$	1

17. Solution

Sol.	$\|x-2\| \geq 1$	
	$\Rightarrow x-2 \geq 1$ or $x-2 \leq -1$	
	$\Rightarrow x \geq 3$ or $x \leq 1$	
	$\Rightarrow x \in (-\infty, 1] \cup [3, \infty)$ --- (i)	**2**
	$\|x-2\| \leq 3$	
	$\Rightarrow -3 \leq x-2 \leq 3 \Rightarrow -1 \leq x \leq 5$	
	$\Rightarrow x \in [-1,5]$ --- (ii)	**2**
	From (i) and (ii)	
	$x \in [-1,1] \cup [3,5]$	**1**