Class XI

TARGET : JEE Main/Adv

1. $\dfrac{(2x-1)^3 (x+4)^2}{(x-5)^5 (x-17)^2} \ge 0$

2. $(x^2 + 1)(x-2)^2 (x-3) < 0$, then x belongs to

    (a) $(-\infty, 2) \cup (2, 3)$ (b) $(-\infty, 3)$

    (c) $(2, 3)$ (d) none of these

3. Find the set of values of 'x' for which the given conditions are true

    (a) $-(x-1)(x-3)(x+5) < 0$

    (b) $\dfrac{(x-1)(x-2)}{(x-3)} \le 0$

4. Solve for x : $\dfrac{(2x-1)(x-1)^4 (x-2)^4}{(x-2)(x-4)^4} \le 0$

    (a) [½, 2]   (b) R

    (c) ϕ (d) (½, 2)

5. Solve for x : $(x-2)^4 (x-3)^3 (x-4)^2 (1-x) \le 0$

    (a) $(1, 3)$ (b) $(-\infty, 1) \cup (3, \infty)$

    (c) $(-\infty, 1] \cup [3, \infty)$ (d) none of these

6. Solve for x : $\dfrac{x^2}{x-1} \ge 0$

    (a) $(1, \infty)$ (b) $[1, \infty)$

    (c) $\{0\} \cup (1, \infty)$ (d) none of these

7. Solve for x : $\dfrac{8x^2 + 16x - 51}{(2x-3)(x+4)} > 3$

8. Solve for x : $\dfrac{4}{1+x} + \dfrac{2}{1-x} < 1$

9. The set of values of x satisfying the inequalities

    $(x-1)(x-2) < 0$ and $(3x-7)(2x-3) > 0$ is

    (a) $(1, 2)$ (b) $(2, 7/3)$

    (c) $(1, 7/3)$ (d) $(1, 3/2)$

10. The value for which $\dfrac{(x-1)}{x} \ge 2$

    (a) $(0, 1)$ (b) $(-\infty, -1)$

    (c) $(-\infty, 0)$ (d) $[-1, 0)$

11. The value of x for which $12x - 6 < 0$ and $12 - 3x < 0$

    (a) ϕ (b) R

    (c) R − {0}   (d) none of these

12. The value of x for which $\dfrac{x-3}{4} - x < \dfrac{x-1}{2} - \dfrac{x-2}{3}$,

    $2 - x > 2x - 8$

    (a) [−1, 10/3]   (b) (−1, 10/3)

    (c) R   (d) none of these

13. Solve for x : $x + \dfrac{1}{x} \ge 2$

    (a) $(0, \infty)$ (b) R

    (c) ϕ (d) $[0, \infty)$

14. Solution of $\dfrac{x-7}{x+3} > 2$ is

    (a) $(-3, \infty)$ (b) $(-\infty, 13)$

    (c) $(-13, -3)$ (d) none of these

15. If $x^2 + 6x - 27 > 0$ and $x^2 - 3x - 4 < 0$, then

    (a) x > 3   (b) x < 3

    (c) 3 < x < 4   (d) x = 7/2

16. If $x^2 - 1 \le 0$ and $x^2 - x - 2 \ge 0$, then x lies in the interval set

    (a) (1, −1)   (b) (−1, 1)

    (c) (1, 2)   (d) {−1}

17. The solution set of $\dfrac{x^2 - 3x + 4}{x+1} > 1$, $x \in R$ is

    (a) $(3, \infty)$ (b) $(-1, 1) \cup (3, \infty)$

    (c) $[-1, 1] \cup [3, \infty)$ (d) none of these

18. $(x - 3) \geq (x - 3)(x - 4)$

19. $(x - 4)(x - 10) \geq 0$ and $(x - 9)(2x + 1) \leq 0$

20. If $c < d$, $x^2 + (c + d)x + cd < 0$, then x belongs to

(a) $(-d, -c]$ (b) $(-d, -c)$

(c) R   (d) ϕ

21. The least integer satisfying,

$$49.4 - \frac{(27 - x)}{10} < 47.4 - \left(\frac{27 - 9x}{10}\right) \text{ is}$$

(a) 2   (b) 3

(c) 4   (d) none of these

22. The solution set of $x^2 + 2 \leq 3x \leq 2x^2 - 5$ is

(a) ϕ (b) $[1, 2]$

(c) $(-\infty, -1) \cup [5/2, \infty)$ (d) none of these

23. The number of integral solutions of $\dfrac{x + 2}{x^2 + 1} > \dfrac{1}{2}$ is

(a) 4   (b) 5

(c) 3   (d) none of these

ANSWER KEY

1. $x \in (-\infty, 1/2] \cup (5, 17) \cup (17, \infty)$ 2. a   3. (a) $(-5, 1) \cup (3, \infty)$; (b) $(-\infty, 1] \cup [2, 3)$ 4. a

5. d   6. c   7. $x \in (-\infty, -4) \cup \left(-3, \dfrac{3}{2}\right) \cup \left(\dfrac{5}{2}, \infty\right)$ 8. $(-\infty, -1) \cup (1, \infty)$ 9. d

10. d   11. a   12. b   13. a   14. c   15. c   16. d   17. b   18. $x \in [3, 5]$

19. $x \in [-1/2, 4]$ 16. b   20. b   21. a   23. c