



MATHS

BOOKS - OBJECTIVE RD SHARMA MATHS VOL I (HINGLISH)

ALGEBRAIC INEQUATIONS

Illustration

$$1. \frac{1}{2} \left(\frac{3x}{5} + 4 \right) \geq \frac{1}{3} (x - 6)$$

A. $[120, \infty]$

B. $(-\infty, 120]$

C. $[0, 120]$

D. $[-120, 0]$

Answer: B



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2.

$$\text{if } \frac{5x}{4} + \frac{3x}{8} > \frac{39}{8} \text{ and } \frac{2x - 1}{12} - \frac{x - 1}{3} < \frac{3x + 1}{4}$$

, then x belongs to the interval

A. $(3, \infty)$

B. $(0, \infty)$

C. $(-\infty, 3)$

D. $(-\infty, 0)$

Answer: A



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3. $-5 \leq \frac{2 - 3x}{4} \leq 9$

A. $(-\infty, 22/3)$

B. $[-34/3, 22/3]$

C. $[22/3, \infty)$

D. $(-\infty, -34/3]$

Answer: B





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4. The set of all values of x satisfying the inequations

$$|x - 1| \leq 5 \text{ and } |x| \geq 2, \text{ is}$$

A. $[-4, 6]$

B. $[-4, -2]$

C. $[-4, -2] \cup [2, 6]$

D. $[2, 6]$

Answer: C



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5. Solve $1 \leq |x - 2| \leq 3$

A. $[-1, 5]$

B. $[3, 5]$

C. $[-1, 1]$

D. $[-1, 1] \cup [3, 5]$

Answer: D



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6. The solution set of the inequation

$$\frac{3}{|x| + 2} \geq 1, \text{ is}$$

A. $[-1, 1]$

B. $(-1, 1)$

C. $(-\infty, 1]$

D. $[1, \infty)$

Answer: A



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7. if $\left| \frac{2}{x-4} \right| > 1$, then x belongs to the interval

A. $(2, 6)$

B. $(2, 4) \cup (4, 6)$

C. $(-\infty, 2)$

D. $(6, \infty)$

Answer: B



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8. यदि $\frac{x - 1}{2} \geq 2$, तब $x \in$

A. $(1, 2)$

B. $(0, 1)$

C. $[5, \infty)$

D. $(1, \infty)$

Answer: C





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9. यदि $(x - 1)^3(x + 1) < 0$ तब $x \in$

A. $(-1, 1)$

B. $(-\infty, -1)$

C. $[-1, 1]$

D. $(-1, \infty)$

Answer: A



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10. $\frac{|x| - 1}{|x| - 2} \leq 0$ then x lies in the interval

A. $[-1, 2]$

B. $(-2, 2)$

C. $(-2, -1] \cup [1, 2)$

D. $[-1, 1]$

Answer: C



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11. Solution set of $(5x - 1) < (x + 1)^2 < (7x - 3)$ is

A. $(1, 4)$

B. $[2, 4]$

C. $(2, 4)$

D. $(-\infty, 1) \cup (2, \infty)$

Answer: C



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Section I Solved Mcqs

1. असमिका का हल $\frac{x-1}{x-2} > 2$, है .

A. $(2, 3)$

B. $[2, 3]$

C. $(-\infty, 2) \cup (3, \infty)$

D. इनमें से कोई नहीं

Answer: A



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2. यदि $5x + 2 < 3x + 8$ तथा $\frac{x + 2}{x - 1} < 4$ तब $x \in :$

A. $(-\infty, 1)$

B. $(2, 3)$

C. $(-\infty, 3)$

D. $(-\infty, 1) \cup (2, 3)$

Answer: D



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3. The solution set of the inequation $|2x - 3| < x - 1$,
is

A. $(\frac{4}{3}, \frac{3}{2}) \cup (\frac{3}{2}, 2)$

B. $(\frac{4}{3}, 2)$

C. $[\frac{3}{2}, 2)$

D. none of these

Answer: B



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4. Write the solution set of the inequation

$$|x - 1| \geq |x - 3|.$$

A. $(-\infty, 2]$

B. $[2, \infty)$

C. $[1, 3)$

D. none of these

Answer: B



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5. The solution set of the inequation

$$||x| - 1| < |1 - x|, x \in \mathbb{R}, \text{ is}$$

A. $(-1, 1)$

B. $(0, \infty)$

C. $(-1, \infty)$

D. none of these

Answer: D



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6. The set of all real numbers x for which

$$x^2 - |x + 2| + x > 0 \text{ is}$$

A. $(-\infty, -2) \cup (2, \infty)$

B. $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$

C. $(-\infty, -1) \cup (1, \infty)$

D. $(\sqrt{2}, \infty)$

Answer: B



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7. The solution set of the inequation $\frac{|x + 3| + x}{x + 2} > 1$,
is

A. $(-5, -2) \cup (-1, \infty)$

B. $(-5, -2)$

C. $(-1, \infty)$

D. none of these

Answer: A



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8. The set of values of x for which the inequality

$|x - 1| + |x + 1| < 4$ always holds true, is

A. $(-2, 2)$

B. $(-\infty, -2) \cup (2, \infty)$

C. $(-\infty, -1] \cup [1, \infty)$

D. none of these

Answer: A



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9. The solution set of the inequation $||x| - 7| - 5 < 0$, is ... ([*] denotes the greatest integer function)

A. $[3, 12)$

B. $(-12, -3]$

C. $(-12, 12)$

D. $(-12, -3] \cup [3, 12)$

Answer: D



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10. If $[x]$ denotes the greatest integer less than or equal to x , then the solution set of inequation $\frac{[x] - 2}{4 - [x]} > 0$, is ...

A. $(2, 3]$

B. $[3, 4)$

C. $[2, 3]$

D. $[3, 4]$

Answer: B



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11. The area of the region represented by

$$|x - y| \leq 3 \text{ and } |x + y| \leq 3, \text{ is}$$

A. 36 sq. units

B. 18 sq. units

C. 72 sq. units

D. 6 sq. units

Answer: B



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12. The total number of integral points i.e. points having integral coordinates lying in the region represented by

the inequations $|x - y| < 3$ and $|x + y| < 3$ is

A. 25

B. 36

C. 13

D. 12

Answer: C



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13. The solution set of the inequation $\left| \frac{1}{x} - 2 \right| < 4$, is

A. $(-\infty, -1/2)$

B. $(1/6, \infty)$

C. $(-1/2, 1/6)$

D. $(-\infty, -1/2) \cup (1/6, \infty)$

Answer: D



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14. The set of real values of x satisfying the inequality

$$|x^2 + x - 6| < 6, \text{ is}$$

A. $(-4, 3)$

B. $(-3, 2)$

C. $(-4, -3) \cup (2, 3)$

D. $(-4, -1) \cup (0, 3)$

Answer: D



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15. The set of real values of x satisfying

$$||x - 1| - 1| \leq 1, \text{ is}$$

A. $[-1, 3]$

B. $[0, 2]$

C. $[-1, 1]$

D. none of these

Answer: A



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16. The largest interval for which

$$x^{12} + x^9 + x^4 - x + 1 > 0 \quad -4$$

A. $(-4, 0]$

B. $(-100, 100)$

C. $(0, 1)$

D. $(-\infty, \infty)$

Answer: D



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17. असमिका $x^2 + 9 < (x + 3)^2 < 8x + 25$ के पूर्णांक हलो की संख्या है:

A. 2

B. 3

C. 4

D. 5

Answer: D



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18. If $x^2 - ax + 1 - 2a^2 > 0$ for all $x \in R$, then ...

A. $a \in (- 2/3, 2/3)$

B. $a \in [- 2/3, 2/3]$

C. $a \in (- 2/3, 1)$

D. $a \in (0, 2/3)$

Answer: A



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19. The least integral value of 'k' for which $(k - 2)x^2 + 8x + k + 4 > 0$ for all $x \in R$, is:

A. 5

B. 4

C. 3

D. none of these

Answer: B



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20. If $9^{x+1} + (a^2 - 4a - 2)3^x + 1 < 0$ for all $x \in \mathbb{R}$,

then

A. $a \in \mathbb{R}$

B. $a \in \mathbb{R}^+$

C. $a \in [1, \infty)$

D. $a \in \mathbb{R} - (2)$

Answer: D



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Exercise

1. The solution set of the inequation $\frac{x + 4}{x - 3} \leq 2$, is

A. $(-\infty, 3) \cup (10, \infty)$

B. $(3, 10]$

C. $(-\infty, 3) \cup [10, \infty)$

D. none of these

Answer: C



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2. If $\frac{3(x - 2)}{5} \geq \frac{5(2 - x)}{3}$, then x belongs to the interval

A. $(2, \infty)$

B. $[2, \infty)$

C. $(-\infty, 2]$

D. none of these

Answer: B



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3. solve the inequation $\frac{2x + 4}{x - 1} \geq 5$ and represent this solution on the number line.

A. $(1, 3)$

B. $(1, 3]$

C. $(-\infty, 1) \cup [3, \infty)$

D. none of these

Answer: B



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4. The solution set of the inequation $\frac{4x + 3}{2x - 5} < 6$, is

A. $(5/2, 33/8)$

B. $(-\infty, 5/2) \cup (33/8, \infty)$

C. $(5/2, \infty)$

D. $(33/8, \infty)$

Answer: B



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5. The number of integral solutions of $2(x + 2) > x^2 + 1$, is

A. 2

B. 3

C. 4

D. 5

Answer: B



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6. If $|3x + 2| < 1$, then x belongs to the interval

A. $(-1, -1/3)$

B. $[-1, -1/3]$

C. $(-\infty, -1)$

D. $(-1/3, \infty)$

Answer: A





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7. The solution set of the inequation

$$|2x - 3| < |x + 2|, \text{ is}$$

A. $(-\infty, 1/3)$

B. $(1/3, 5)$

C. $(5, \infty)$

D. $(-\infty, 1/3) \cup (5, \infty)$

Answer: B



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8. The solution set of the inequation $\left| \frac{3}{x} + 1 \right| > 2$, is

A. $(0, 3]$

B. $[-1, 0]$

C. $(-1, 0) \cup (0, 3)$

D. none of these

Answer: C



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9. The solution set of the inequation $0 < |3x + 1| < \frac{1}{3}$

, is

A. $(-4/9, -2/9)$

B. $[-4/9, -2/9]$

C. $(-4/9, -2/9) - [-1/3]$

D. $[-4/9 - 2/9] - [-1/3]$

Answer: C



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10. असमिका $\frac{x^2 - 3x + 4}{x + 1} > 1, x \in \mathbb{R}$, का हल समुच्चय है
 $x \in$

A. $(3, \infty)$

B. $(-1, 1) \cup (3, \infty)$

C. $[-1, 1] \cup [3, \infty)$

D. none of these

Answer: B



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11. The solution set of the inequation...

$$\frac{2}{|x - 4|} > 1, x \neq 4 \text{ is ...}$$

A. $(2, 6)$

B. $(2, 4) \cup (3, \infty)$

C. $[-1, 1] \cup [3, \infty)$

D. none of these

Answer: B



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12. The solution set of the inequation $\frac{1}{|x| - 3} < \frac{1}{2}$ is

A. $(-\infty, -5) \cup (5, \infty)$

B. $(-3, 3)$

C. $(-\infty, -5) \cup (-3, 3) \cup (5, \infty)$

D. none of these

Answer: C



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13. The solution set of the inequation $\left| \frac{2x - 1}{x - 1} \right| > 2$, is

A. $(3/4, 1) \cup (1, \infty)$

B. $(3/4, \infty)$

C. $(-\infty, 3/4)$

D. none of these

Answer: A



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14. The solution set of the inequation $\frac{|x - 2|}{x - 2} < 0$, is

A. $(2, \infty)$

B. $(-\infty, 2)$

C. R

D. $(-2, 2)$

Answer: B



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15. Write the solution set of inequation $\left| x + \frac{1}{x} \right| > 2$.

A. $R - \{0\}$

B. $R - \{-1, 0, 1\}$

C. $R - \{1\}$

D. $R - \{-1, 1\}$

Answer: B



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16. The solution set of the inequation

$$|x - 1| + |x - 2| + |x - 3| \geq 6 \text{ is}$$

A. $[0, 4]$

B. $(-\infty, -2) \cup [4, \infty)$

C. $(-\infty, 0] \cup [4, \infty)$

D. none of these

Answer: C



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17. 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

Answer: A



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18. Write the set of values of x satisfying

$$|x - 1| \leq 3 \text{ and } |x - 1| \leq 1.$$

A. $[2, 4]$

B. $(-\infty, 2] \cup [4, \infty)$

C. $[-2, 0] \cup [2, 4]$

D. none of these

Answer: C



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19. The solution set of the inequation

$$x^2 + (a + b)x + ab < 0, \quad \text{where } a < b, \text{ is}$$

A. (a, b)

B. $(-\infty, a) \cup (b, \infty)$

C. $(-b, -a)$

D. $(-\infty, -b) \cup (-a, \infty)$

Answer: C



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20. The number of integral solutions of $x^2 - 3x - 4 < 0$, is

A. 3

B. 4

C. 6

D. none of these

Answer: B



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21. The solutiong set of $|x^2 - 10| \leq 6$, is

A. $(2, 4)$

B. $(-4, -2)$

C. $(-4, -2) \cup (2, 4)$

D. $[-4, -2] \cup [2, 4]$

Answer: D



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22. The solution set of the inequation $\left| x + \frac{1}{x} \right| < 4$, is

A. $(2 - \sqrt{3}, 2 + \sqrt{3}) \cup (-2 - \sqrt{3}, -2 + \sqrt{3})$

B. $R - (2 - \sqrt{3}, 2 + \sqrt{3})$

C. $R - (-2 - \sqrt{3}, -2 + \sqrt{3})$

D. none of these

Answer: A



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23. The solution set of $x^2 + x + |x| + 1 < 0$, is

A. $(0, \infty)$

B. $(-\infty, 0)$

C. \mathbb{R}

D. ϕ

Answer: D



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24. If $|x - 1| + |x| + |x + 1| \geq 6$, then x belongs to

A. $(-\infty, 2)$

B. $(-\infty, -2] \cup [2, \infty)$

C. \mathbb{R}

D. ϕ

Answer: B



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25. If $\left| \frac{x^2 + 6}{5x} \right| \geq 1$, then x belongs to

A. $(-\infty, -3)$

B. $(-\infty, -3) \cup (3, \infty)$

C. $(-\infty, -3] \cup [-2, 0) \cup (0, 2] \cup [3, \infty)$

D. \mathbb{R}

Answer: C



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26. the greatest negative integer satisfying

$$x^2 + 4x - 77 < 0 \text{ and } x^2 > 4 \text{ is}$$

A. -4

B. -6

C. -7

D. none of these

Answer: D



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27. If $2 - 3x - 2x^2 \geq 0$, then

A. $x \leq -2$

B. $-2 \leq x \leq \frac{1}{2}$

C. $x \geq -2$

D. $x \leq \frac{1}{2}$

Answer: B



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28. The solution of $6 + x - x^2 > 0$, is

A. $-1 < x < 2$

B. $-2 < x < 3$

C. $-2 < x < -1$

D. none of these

Answer: B



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29. If $4 \leq x \leq 9$, then

A. $(x - 4)(x - 9) \leq 0$

B. $(x - 4)(x - 9) \geq 0$

C. $(x - 4)(x - 9) < 0$

D. $(x - 4)(x - 9) > 0$

Answer: A





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30. The set of real values of x for which

$$\frac{10x^2 + 17x - 34}{x^2 + 2x - 3} < 8, \text{ is}$$

A. $(-5/2, 2)$

B. $(0, \infty)$

C. $(-1, \infty)$

D. none of these

Answer: B



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31. The solution set of the inequation $||x| - 1| < |1-x|, x \in \mathbb{R}$, is (i) $(-1, 1)$ (ii) $(0, \infty)$ (iii) $(-1, \infty)$ (iv) none of these

A. $(-1, 1)$

B. $(0, \infty)$

C. $(-1, \infty)$

D. none of these

Answer: D



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32. Find the set of all x for which

$$\frac{2x}{(2x^2 + 5x + 2)} > \frac{1}{(x + 1)}.$$

A. $(-2, -1)$

B. $(-2/3, 0)$

C. $(-2/3, -1/2)$

D. $(-2, -1) \cup (-2/3, -1/2)$

Answer: D



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33. Solve $\frac{8x^2 + 16x - 51}{2x^2 + 5x - 12} > 3$

A. $(\frac{3}{2}, \frac{5}{2})$

B. $(-4, -3)$

C. $(-4, -3) \cup (\frac{3}{2}, \frac{5}{2})$

D. none of these

Answer: C



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34. Solution set of $(5x - 1) < (x + 1)^2 < (7x - 3)$ is

A. ϕ

B. $\{1\}$

C. $\{2\}$

D. {3}

Answer: D



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35. The number of integral solutions of $\frac{x + 1}{x^2 + 2} > \frac{1}{4}$ is

A. 1

B. 2

C. 5

D. 4

Answer: C





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36. 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

Answer: A



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37. If x is an integer satisfying $x^2 - 6x + 5 \leq 0$ and $x^2 - 2x > 0$, then the number of possible values of x , is

A. 3

B. 4

C. 2

D. infinite

Answer: A



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38. If p, q, r, s, t are numbers such that $p + q < r + s$
 $q + r < s + t$ $r + s < t + p$ $s + t < p + q$ then the
largest and smallest numbers are

- A. p and q respectively
- B. r and t respectively
- C. r and q respectively
- D. q and p respectively

Answer: A



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

4 2. 5 3. 3 4. 2 5. 6

A. 4

B. 5

C. 3

D. 2

Answer: C



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