



## MATHS

### BOOKS - OBJECTIVE RD SHARMA ENGLISH

#### ALGEBRAIC INEQUATIONS

##### Illustration

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

A.  $[120, \infty]$

B.  $(-\infty, 120]$

C.  $[0, 120]$

D.  $[-120, 0]$

**Answer: B**



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2.

if  $\frac{5x}{4} + \frac{3x}{8} > \frac{39}{8}$  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. if  $\frac{x - 1}{2} \geq 2$ , then x belongs to the interval

A. (1, 2)

B. (0, 1)

C.  $[5, \infty)$

D.  $(1, \infty)$

**Answer: C**



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9. The set of all values of  $x$  satisfying the inequations

$$(x - 1)^3(x + 1) < 0 \text{ is}$$

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

A.  $(2, 3)$

B.  $[2, 3]$

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

D. none of these

**Answer: A**



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2. The complete set of values of 'x' which satisfy the inequations:  $5x + 2 < 3x + 8$  and  $\frac{x + 2}{x - 1} < 4$  is :

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.  $(4/3, 3/2) \cup (3/2, 2)$

B.  $(4/3, 2)$

C.  $[3/2, 2)$

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  $|x| - 1 < 1 - x$ ,

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  $x^2 - |x + 2| + x > 0$  is  $(-\infty, -2)$  b.  $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$  c.  $(-\infty, -1) \cup (1, \infty)$  d.  $(\sqrt{2}, \infty)$

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. The number of integral solutions of  $x^2 + 9 < (x + 3)^2 < 8x + 25$  is

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: A**



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

then

A.  $a \in R$

B.  $a \in R^+$

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

D.  $a \in R - (2)$

**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. The solution set of the inequation

$$\frac{x^2 - 3x + 4}{x + 1} > 1, x \in \mathbb{R}, \text{ is}$$

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

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

D. none of these

**Answer: B**



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**12.** What is the solution set of the inequality

$$\frac{1}{|x| - 3} < \frac{1}{2} ?$$

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.  $(34, 1) \cup (1, \infty)$

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.  $\mathbb{R}$

D.  $(-2, 2)$

**Answer: B**



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

A.  $\mathbb{R} - \{0\}$

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

C.  $\mathbb{R} - \{1\}$

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

**Answer: B**



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**16.** If the complete set of value of  $x$  satisfying

$$|x - 1| + |x - 3| \geq (-\infty, a] \cup [b, \infty), \quad \text{then}$$

$$a + b = :$$

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.  $\phi$

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: d**



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19. The solution set of the inequation

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

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.  $\phi$

**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.  $\phi$

**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.  $(3/2, 5/2)$

B.  $(-4, -3)$

C.  $(-4, -3) \cup (3/2, 5/2)$

D. none of these

**Answer: C**



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34. The solution set of

$(5x - 1) < (x + 1)^2 < (7x - 3)$  is

A.  $\phi$

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.  $\phi$

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  $x^2 - 6x + 5 \geq 0$  and  $x^2 - 2x > 0$  then the number of positive 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

(A) 4 (B) 5 (C) 3 (D) 2 (E) 6

A. 4

B. 5

C. 3

D. 2

**Answer: C**



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