

Course: RBI ASSISTANT Mains

Subject: : Quadratic Inequalities

Time:10 Minutes

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Directions (1-5): दिए गए द्विघात समीकरणों को हल करें और अपने उत्तर के आधार पर सही विकल्प को चुनिए-

(a) $x < y$

(b) $x \leq y$

(c) $x = y$ या x और y के बीच कोई संबंध स्थापित नहीं किया जा सकता है।

(d) $x > y$

(e) $x \geq y$

Q1. I. $2x^2 - 9\sqrt{5}x + 50 = 0$
II. $y^2 - 11\sqrt{3}y + 90 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q2. I. $25x^2 - 25x + 6 = 0$
II. $49y^2 - 49y + 12 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q3. I. $9x^2 - 18x + 8 = 0$
II. $15y^2 + 4y - 4 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q4. I. $12x^2 - 45x + 42 = 0$
II. $8y^2 - 26y + 21 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q5. I. $x^2 + 30x + 221 = 0$
II. $y^2 + 20y + 99 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Directions (6-10): इनमें से प्रत्येक प्रश्न में, दो समीकरण (I) और (II) दिए गए हैं। दोनों समीकरणों को हल करें और उत्तर दीजिए-

- (a) यदि $x > y$
- (b) यदि $x \geq y$
- (c) यदि $x < y$
- (d) यदि $x \leq y$
- (e) यदि $x = y$ या x और y के बीच कोई संबंध स्थापित नहीं किया जा सकता है।

Q6. I. $36x^2 - 13x + 1 = 0$

II. $24y^2 - 14y + 1 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q7. I. $36x^2 + 33x - 20 = 0$

II. $12y^2 + 46y + 40 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q8. I. $2x^2 + 7x - 60 = 0$

II. $3y^2 - 32y + 80 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q9. I. $14x^2 + 11x + 2 = 0$

II. $42y^2 - 11y - 3 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q10. I. $5x^2 - 46x + 96 = 0$

II. $10y^2 - 57y + 80 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Directions (11-15): इनमें से प्रत्येक प्रश्न में, दो समीकरण (I) और (II) दिए गए हैं। आपको दोनों समीकरणों को हल करना होगा और जवाब देना होगा-

- (a) यदि $x > y$
 (b) यदि $x \geq y$
 (c) यदि $x < y$
 (d) यदि $x \leq y$
 (e) यदि $x = y$ या x और y के बीच कोई संबंध स्थापित नहीं किया जा सकता है।

Q11. I. $5x^2 - 28x + 39 = 0$

II. $2y^2 - 13y + 20 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q12. I. $3x^2 - 13x + 14 = 0$

II. $2y^2 - 17y + 33 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q13. I. $2x^2 + 3x - 27 = 0$

II. $3y^2 - 5y - 42 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q14. I. $x^2 - 2x - 15 = 0$

II. $y^2 - 4y - 12 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Q15. I. $12x^2 - 17x + 6 = 0$

II. $y^2 - 16y + 63 = 0$

L1Difficulty 3

QTagsQuadratic Inequalities

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Solutions

S1. Ans. (a)

Sol.

$$I. 2x^2 - 9\sqrt{5}x + 50 = 0$$

$$2x^2 - 4\sqrt{5}x - 5\sqrt{5}x + 50 = 0$$

$$2x(x - 2\sqrt{5}) - 5\sqrt{5}(x - 2\sqrt{5}) = 0$$

$$(2x - 5\sqrt{5})(x - 2\sqrt{5}) = 0$$

$$x = 2\sqrt{5}, \frac{5\sqrt{5}}{2}$$

$$\text{II. } y^2 - 11\sqrt{3}y + 90 = 0$$

$$y^2 - 5\sqrt{3}y - 6\sqrt{3}y + 90 = 0$$

$$y(y - 5\sqrt{3}) - 6\sqrt{3}(y - 5\sqrt{3}) = 0$$

$$(y - 6\sqrt{3})(y - 5\sqrt{3}) = 0$$

$$y = 6\sqrt{3}, 5\sqrt{3}$$

$$y > x$$

S2. Ans. (c)

Sol.

$$\text{I. } 25x^2 - 25x + 6 = 0$$

$$25x^2 - 10x - 15x + 6 = 0$$

$$5x(5x - 2) - 3(5x - 2) = 0$$

$$(5x - 3)(5x - 2) = 0$$

$$x = \frac{3}{5}, \frac{2}{5}$$

$$\text{II. } 49y^2 - 49y + 12 = 0$$

$$49y^2 - 28y - 21y + 12 = 0$$

$$7y(7y - 4) - 3(7y - 4) = 0$$

$$(7y - 3)(7y - 4) = 0$$

$$y = \frac{3}{7}, \frac{4}{7}$$

No relation can be established between x & y.

S3. Ans. (d)

Sol.

$$\text{I. } 9x^2 - 18x + 8 = 0$$

$$9x^2 - 6x - 12x + 8 = 0$$

$$3x(3x - 2) - 4(3x - 2) = 0$$

$$(3x - 4)(3x - 2) = 0$$

$$x = \frac{2}{3}, \frac{4}{3}$$

$$\text{II. } 15y^2 + 4y - 4 = 0$$

$$15y^2 + 10y - 6y - 4 = 0$$

$$5y(3y + 2) - 2(3y + 2) = 0$$

$$(5y - 2)(3y + 2) = 0$$

$$y = \frac{2}{5}, -\frac{2}{3}$$

$$x > y$$

S4. Ans. (e)

Sol.

$$\begin{aligned}
12x^2 - 45x + 42 &= 0 \\
12x^2 - 24x - 21x + 42 &= 0 \\
12x(x-2) - 21(x-2) &= 0 \\
(12x-21)(x-2) &= 0
\end{aligned}$$

$$x = 2, \frac{7}{4}$$

$$\begin{aligned}
\text{II. } 8y^2 - 26y + 21 &= 0 \\
8y^2 - 14y - 12y + 21 &= 0 \\
2y(4y-7) - 3(4y-7) &= 0 \\
(2y-3)(4y-7) &= 0
\end{aligned}$$

$$y = \frac{3}{2}, \frac{7}{4}$$

$$x \geq y$$

S5. Ans. (a)

Sol.

$$\begin{aligned}
x^2 + 30x + 221 &= 0 \\
x^2 + 17x + 13x + 221 &= 0 \\
x(x+17) + 13(x+17) &= 0 \\
(x+13)(x+17) &= 0 \\
x &= -13, -17
\end{aligned}$$

$$\begin{aligned}
\text{II. } y^2 + 20y + 99 &= 0 \\
y^2 + 11y + 9y + 99 &= 0 \\
y(y+11) + 9(y+11) &= 0 \\
(y+9)(y+11) &= 0
\end{aligned}$$

$$y = -9, -11$$

$$y > x$$

S6. Ans.(e)

Sol. I. $36x^2 - 13x + 1 = 0$

$$36x^2 - 9x - 4x + 1 = 0$$

$$\begin{aligned}
9x(4x-1) - 1(4x-1) &= 0 \\
(9x-1)(4x-1) &= 0
\end{aligned}$$

$$x = \frac{1}{4}, \frac{1}{9}$$

II. $24y^2 - 14y + 1 = 0$

$$\begin{aligned}
24y^2 - 12y - 2y + 1 &= 0 \\
12y(2y-1) - 1(2y-1) &= 0 \\
(2y-1)(12y-1) &= 0 \\
y &= \frac{1}{2}, \frac{1}{12}
\end{aligned}$$

No relation can be established between x and y

S7. Ans.(b)

Sol. I. $36x^2 + 33x - 20 = 0$

$$36x^2 + 48x - 15x - 20 = 0$$

$$x = \frac{-4}{3}, \frac{5}{12}$$

$$\text{II. } 12y^2 + 46y + 40 = 0$$

$$6y(2y + 5) + 8(2y + 5) = 0$$

$$(2y + 5)(6y + 8) = 0$$

$$y = \frac{-4}{3}, -2.5$$

$$x \geq y$$

S8. Ans.(d)

$$\text{Sol. I. } 2x^2 + 7x - 60 = 0$$

$$x = 4, -\frac{15}{2}$$

$$\text{II. } 3y^2 - 32y + 80 = 0$$

$$x \leq y$$

S9. Ans.(c)

$$\text{Sol. I. } 14x^2 + 11x + 2 = 0$$

$$\text{II. } 42y^2 - 11y - 3 = 0$$

$$y = \frac{3}{7}, -\frac{1}{6}$$

S10. Ans.(b)

$$\text{Sol. I. } 5x^2 - 46x + 96 = 0$$

$$12x(3x + 4) - 5(3x + 4) = 0$$
$$(12x - 5)(3x + 4) = 0$$

$$12y^2 + 30y + 16y + 40 = 0$$

$$2x^2 + 15x - 8x - 60 = 0$$
$$x(2x + 15) - 4(2x + 15) = 0$$
$$(x - 4)(2x + 15) = 0$$

$$3y^2 - 12y - 20y + 80 = 0$$
$$3y(y - 4) - 20(y - 4) = 0$$
$$(y - 4)(3y - 20) = 0$$
$$y = 4, \frac{20}{3}$$

$$14x^2 + 7x + 4x + 2 = 0$$
$$7x(2x + 1) + 2(2x + 1) = 0$$
$$(7x + 2)(2x + 1) = 0$$
$$x = \frac{-1}{2}, \frac{-2}{7}$$

$$42y^2 - 18y + 7y - 3 = 0$$
$$6y(7y - 3) + 1(7y - 3) = 0$$
$$(6y + 1)(7y - 3) = 0$$

$$x < y$$

$$5x^2 - 30x - 16x + 96 = 0$$
$$5x(x - 6) - 16(x - 6) = 0$$
$$(5x - 16)(x - 6) = 0$$

$$x = \frac{16}{5}, 6$$

II. $10y^2 - 57y + 80 = 0$

$$\begin{aligned} 10y^2 - 25y - 32y + 80 &= 0 \\ 5y(2y - 5) - 16(2y - 5) &= 0 \\ (5y - 16)(2y - 5) &= 0 \\ y &= \frac{16}{5}, \frac{5}{2} \\ x &\geq y \end{aligned}$$

S11. Ans.(e)

Sol.

$$\begin{array}{l|l} \text{I. } 5x^2 - 28x + 39 = 0 & \text{II. } 2y^2 - 13y + 20 = 0 \\ 5x^2 - 13x - 15x + 39 = 0 & 2y^2 - 8y - 5y + 20 = 0 \\ x(5x - 13) - 3(5x - 13) = 0 & 2y(y - 4) - 5(y - 4) = 0 \\ x = 3, \frac{13}{5} & y = 4, \frac{5}{2} \end{array}$$

No relation

S12. Ans.(c)

Sol

$$\begin{array}{l|l} \text{I. } 3x^2 - 13x + 14 = 0 & \text{II. } 2y^2 - 17y + 33 = 0 \\ 3x^2 - 7x - 6x + 14 = 0 & 2y^2 - 11y - 6y + 33 = 0 \\ x(3x - 7) - 2(3x - 7) = 0 & y(2y - 11) - 3(2y - 11) = 0 \\ x = 2, \frac{7}{3} & y = 3, \frac{11}{2} \end{array}$$

$y > x$

S13. Ans.(e)

Sol.

I) $2x^2 + 3x - 27 = 0$

$$2x^2 + 9x - 6x - 27 = 0$$

$$x(2x + 9) - 3(2x + 9) = 0$$

$$(2x + 9)(x - 3) = 0$$

$$x = \frac{-9}{2}, 3$$

II) $3y^2 - 5y - 42 = 0$

$$3y^2 - 14y + 9y - 42 = 0$$

$$y(3y - 14) + 3(3y - 14) = 0$$

$$(y + 3)(3y - 14) = 0$$

$$y = -3, \frac{14}{3}$$

No relation can be established between x & y

S14. Ans.(e)

Sol.

$$(i) x^2 - 5x + 3x - 15 = 0$$

$$(x - 5)(x + 3) = 0$$

$$x = -3, 5$$

$$(ii) y^2 - 6y + 2y - 12 = 0$$

$$y(y - 6) + 2(y - 6) = 0$$

$$(y + 2)(y - 6) = 0$$

$$y = -2, 6$$

No relation can be established between x and y .

S15. Ans.(c)

Sol.

$$\begin{array}{l} \text{I. } 12x^2 - 17x + 6 = 0 \\ 12x^2 - 9x - 8x + 6 = 0 \\ 3x(4x - 3) - 2(4x - 3) = 0 \\ x = \frac{2}{3}, \frac{3}{4} \end{array} \quad \left| \quad \begin{array}{l} \text{II. } y^2 - 16y + 63 = 0 \\ y^2 - 7y - 9y + 63 = 0 \\ y(y - 7) - 9(y - 7) = 0 \\ (y - 9)(y - 7) = 0 \\ y = 9, 7 \end{array} \right.$$

$x < y$