

Course: IBPS RRB Prelims

Subject: Quadratic Inequalities

Time:10 Minutes

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Directions (1-5): निम्नलिखित प्रश्नों में, x और y दो समीकरण दिए गए हैं। इन समीकरणों को हल करें और उत्तर दीजिए-

I. $x^2 + 7x + 12 = 0$

Q1. II. $4y^2 = 36$

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

L1Difficulty 2

QTagsQuadratic Inequalities

QCreatorDeepak Rohilla

I. $2x^2 + 5x + 3 = 0$

Q2. II. $y^2 + 3x + 2 = 0$

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

L1Difficulty 2

QTagsQuadratic Inequalities

QCreatorDeepak Rohilla

I. $2x + 3y = 5$

Q3. II. $3x + 2y = 10$

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

L1Difficulty 2

QTagsQuadratic Inequalities

QCreatorDeepak Rohilla

I. $x^2 + 19x + 84 = 0$

Q4. II. $y^2 + 14y + 49 = 0$

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

L1Difficulty 2

QTagsQuadratic Inequalities

QCreatorDeepak Rohilla

I. $3x^2 + 4x + 1 = 0$

Q5. II. $2y^2 + 3y + 1 = 0$

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

L1Difficulty 2

QTagsQuadratic Inequalities

QCreatorDeepak Rohilla

Directions (6 - 15) : 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 $x > y$
- (c) यदि a और b के बीच संबंध स्थापित नहीं किया जा सकता है
- (d) यदि $x \geq y$
- (e) यदि $x \leq y$

Q6. I. $x^2 + 3x = 28$

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

L1Difficulty 2

QTagsQuadratic Inequalities

QCreatorDeepak Rohilla

Q7. I. $x = \sqrt[3]{2744}$

II. $y^2 = 441$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q8. I. $8x^2 - 49x + 45 = 0$

II. $6y^2 - y - 7 = 0$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q9. I. $42x - 17y = -67$

II. $7x + 12y = -26$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q10. I. $x^2 - 8x + 15 = 0$

II. $2y^2 - 21y + 55 = 0$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q11. I. $x^2 + 9x - 22 = 0$

II. $2y^2 - 7y + 6 = 0$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q12. I. $2y^2 - 13y - 34 = 0$

II. $3x^2 - 11x - 20 = 0$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q13. I. $x^4 = 256$

II. $y^2 - 16y + 64 = 0$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q14. I. $(x - 4)^2 = 9$

II. $(2y + 3)^2 = 25$

L1Difficulty 2

QTagsQuadratic Inequalities

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Q15. I. $2x + 3y = 4$

II. $4x + 5y = 6$

Solutions

S1. Ans.(d)

Sol.

$$\text{I. } x^2 + 7x + 12 = 0$$

$$\Rightarrow x = -3, -4$$

$$\text{II. } y^2 = 9$$

$$\Rightarrow y = \pm 3$$

$$y \geq x$$

S2. Ans.(e)

Sol.

$$\text{I. } 2x^2 + 5x + 3 = 0$$

$$\Rightarrow 2x^2 + 2x + 3x + 3 = 0$$

$$\Rightarrow (x+1)(2x+3) = 0$$

$$\Rightarrow x = -1, -\frac{3}{2}$$

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

$$\Rightarrow (y+1)(y+2) = 0$$

$$\Rightarrow y = -1, -2$$

No relation

S3. Ans.(a)

Sol.

$$(2x + 3y = 5) \cdot 2$$

$$(3x + 2y = 10) \cdot 3$$

On subtracting, we get

$$-5x = -20$$

$$\Rightarrow x = 4$$

$$\therefore y = \frac{5-8}{3}$$

$$= -1$$

$$x > y$$

S4. Ans.(d)

Sol.

$$\begin{aligned}
 \text{I. } & x^2 + 19x + 84 = 0 \\
 \Rightarrow & (x + 7)(x + 12) = 0 \\
 \Rightarrow & x = -7, -12 \\
 \text{II. } & y^2 + 14y + 49 = 0 \\
 \Rightarrow & (y + 7)^2 = 0 \\
 \Rightarrow & y = -7 \\
 y & \geq x
 \end{aligned}$$

S5. Ans.(e)

Sol.

$$\begin{aligned}
 \text{I. } & 3x^2 + 4x + 1 = 0 \\
 \Rightarrow & 3x^2 + 3x + x + 1 = 0 \\
 \Rightarrow & (x + 1)(3x + 1) = 0 \\
 \Rightarrow & x = -1, -\frac{1}{3} \\
 \text{II. } & 2y^2 + 3y + 1 = 0 \\
 \Rightarrow & 2y^2 + 2y + y + 1 = 0 \\
 \Rightarrow & (y + 1)(2y + 1) = 0 \\
 \Rightarrow & y = -1, -\frac{1}{2}
 \end{aligned}$$

No relation

S6. Ans. (d)

Sol.

$$\text{I. } x^2 + 3x - 28 = 0$$

$$\begin{aligned}
 & x^2 + 7x - 4x - 28 = 0 \\
 & x(x + 7) - 4(x + 7) = 0 \\
 & (x + 7)(x - 4) = 0 \\
 & x = -7, 4
 \end{aligned}$$

$$\text{II. } y^2 + 16y + 63 = 0$$

$$\begin{aligned}
 & y^2 + 7y + 9y + 63 = 0 \\
 & y(y + 7) + 9(y + 7) = 0 \\
 & (y + 7)(y + 9) = 0 \\
 & y = -7, -9
 \end{aligned}$$

So, $x \geq y$

S7. Ans. (c)

Sol.

$$\text{I. } x = \sqrt[3]{2744}$$

$$x = 14$$

$$\text{II. } y^2 = 441$$

$$y = \pm 21$$

So, no relation

S8. Ans. (c)

Sol.

$$\text{I. } 8x^2 - 49x + 45 = 0$$

$$\begin{aligned} 8x^2 - 40x - 9x + 45 &= 0 \\ 8x(x - 5) - 9(x - 5) &= 0 \\ (x - 5)(8x - 9) &= 0 \\ x = 5, \frac{9}{8} \end{aligned}$$

$$\text{II. } 6y^2 - y - 7 = 0$$

$$\begin{aligned} 6y^2 - 6y - 7y - 7 &= 0 \\ 6y(y + 1) - 7(y + 1) &= 0 \\ (6y - 7)(y + 1) &= 0 \\ y = \frac{7}{6}, -1 \end{aligned}$$

So, no relation

S9. Ans. (a)

Sol.

Multiply II by 6 and equate with I

$$\begin{aligned} 42x - 17y + 67 &= 42x + 72y + 156 \\ 89y &= -89 \\ y &= -1 \end{aligned}$$

And $x = -2$

So, $y > x$.

S10. Ans. (e)

Sol.

$$\text{I. } x^2 - 8x + 15 = 0$$

$$\begin{aligned} x^2 - 5x - 3x + 15 &= 0 \\ x(x - 5) - 3(x - 5) &= 0 \\ (x - 5)(x - 3) &= 0 \\ x = 3, 5 \end{aligned}$$

$$\text{II. } 2y^2 - 21y + 55 = 0$$

$$\begin{aligned} 2y^2 - 10y - 11y + 55 &= 0 \\ 2y(y - 5) - 11(y - 5) &= 0 \\ (y - 5)(2y - 11) &= 0 \\ y = 5, \frac{11}{2} \end{aligned}$$

So, $y \geq x$

S11. Ans.(c)

Sol.

$$\text{I. } x^2 + 9x - 22 = 0$$

$$\Rightarrow x^2 + 11x - 2x - 22 = 0$$

$$\Rightarrow (x + 11)(x - 2) = 0$$

$$\Rightarrow x = -11, 2$$

$$\text{II. } 2y^2 - 7y + 6 = 0$$

$$\Rightarrow 2y^2 - 4y - 3y + 6 = 0$$

$$\Rightarrow 2y(y-2) - 3(y-2) = 0$$

$$\Rightarrow (y-2)(2y-3) = 0$$

$$\Rightarrow y = 2, \frac{3}{2}$$

No relation

S12. Ans.(c)

Sol.

$$\text{I. } 2y^2 - 13y - 34 = 0$$

$$\Rightarrow 2y^2 - 17y + 4y - 34 = 0$$

$$\Rightarrow y(2y-17) + 2(2y-17) = 0$$

$$\Rightarrow (2y-17)(y+2) = 0$$

$$\Rightarrow y = \frac{17}{2}, -2$$

$$\text{II. } 3x^2 - 11x - 20 = 0$$

$$\Rightarrow 3x^2 - 15x + 4x - 20 = 0$$

$$\Rightarrow 3x(x-5) + 4(x-5) = 0$$

$$\Rightarrow (x-5)(3x+4) = 0$$

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

No relation

S13. Ans.(a)

Sol.

$$\text{I. } x^4 = 256$$

$$\Rightarrow x = \pm 4$$

$$\text{II. } y^2 - 16y + 64 = 0$$

$$\Rightarrow (y-8)^2 = 0$$

$$\Rightarrow y = 8$$

$$y > x$$

S14. Ans.(d)

Sol.

$$\text{I. } (x-4)^2 = 9$$

$$\Rightarrow x - 4 = \pm 3$$

$$\Rightarrow x = 7, 1$$

$$\text{II. } (2y+3)^2 = 25$$

$$\Rightarrow 2y+3 = \pm 5$$

$$\Rightarrow y = 1, -4$$

$$\Rightarrow x \geq y$$

S15. Ans.(a)

Sol.

$$\text{I. } 2x + 3y = 4$$

$$\text{II. } 4x + 5y = 6$$

Solving eq. (I) and (II),

$$(2x + 3y = 4) \times 2$$

$$4x + 5y = 6$$

$$y = 2$$

Put $y = 2$ in eq. (I),

$$2x + 6 = 4$$

$$\Rightarrow x = -1$$

$$y > x$$