Course: SBI Clerk Mains

Subject:Quadratic Inequalities and Simplification

Time:10 Minutes
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Directions (1-5): 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 $x \geq y$
(d) यदि $x \leq y$
(e) यदि $x = y$ या कोई सम्बन्ध स्थापित नहीं किया जा सकता

Q1. (i) $x^2 + 16x - 192 = 0$
(ii) $y^2 - 20y + 96 = 0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q2. (i) $8x + 3y = 7$
(ii) $4x + 9y = 8.5$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q3. (i) $6x^2 - 17x + 12 = 0$
(ii) $12y^2 - 17y + 6 = 0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q4. (i) $5x^2 + 59x + 44 = 0$
(ii) $2y^2 + 13y + 15 = 0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q5. (i) $x^2 - 36x + 315 = 0$
(ii) $y^2 - 23y + 120 = 0$
L1Difficulty 3
QTagsQuadratic Inequalities
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Directions (6-10): निम्नलिखित प्रश्नों में प्रश्नवाचक चिह्न (?) के स्थान पर क्या मान आएगा–

Q6. $302 \times 15 - 12 \times 260 + \sqrt{?} = (11)^3 + (9)^2$
(a) 1
(b) 9
(c) 4
(d) 16
(e) 25
L1Difficulty 3
QTagsSimplification
QCreatorDeepak Rohilla

Q7. 700 का 35% + 256 का 25% = ?
(a) 229
(b) 320
(c) 309
(d) 302
(e) 216
L1Difficulty 3
QTagsSimplification
QCreatorDeepak Rohilla

Q8. $2\frac{1}{3} + 5\frac{2}{5} + 4\frac{1}{3} = ?$
(a) $\frac{181}{15}$
(b) $\frac{172}{15}$
(c) $\frac{214}{15}$
(d) $\frac{203}{15}$
(e) $\frac{191}{3}$
L1Difficulty 3
QTagsSimplification
QCreatorDeepak Rohilla

Q9. $1024 \div 128 + 350$ का 34% = $(?)^2 + 90 \div 15$
(a) 10
(b) 12
(c) 8
(d) 5
(e) 11
L1Difficulty 3
QTagsSimplification
QCreatorDeepak Rohilla

Q10. $5\frac{2}{13} \times 338 + ? = 7^3 \times 3^2$
(a) 1331
(b) 1345
(c) 1290

(d) 1156
(e) 1225
L1Difficulty 3
QTagsSimplification
QCreatorDeepak Rohilla

Direction (11-15): प्रत्येक प्रश्न में दो समीकरण (I) और (II) दिए गए हैं। इन समीकरणों के आधार पर 'x' और 'y' के मध्य संबंध निर्धारित कीजिए 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 मध्य सम्बन्ध स्थापित नहीं किया जा सकता

Q11. **I.** $x^2-8\sqrt{3}x+45=0$
II. $y^2-\sqrt{2}y-24=0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q12. **I.** $12x^2-17x+6=0$
II. $20y^2-31y+12=0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q13. **I.** $35x^2-53x+20 = 0$
II. $56y^2-97y+42=0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q14. **I.** $x^2-5x-14 = 0$
II. $y^2+7y+10 = 0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Q15. **I.**$14x^2 + 11x - 15 = 0$
II.$20y^2 - 31y + 12 = 0$
L1Difficulty 3
QTagsQuadratic Inequalities
QCreatorDeepak Rohilla

Solutions

S1. Ans.(d)

Sol.
(i) $x^2 + 16x - 192 = 0$
$x^2 + 24x - 8x - 192 = 0$

$$x(x + 24) - 8(x + 24) = 0$$
$$(x + 24)(x - 8) = 0$$

x = – 24, 8

(ii) $y^2 - 20y + 96 = 0$
$y^2 - 8y - 12y + 96 = 0$

$$y(y - 8) - 12(y - 8) = 0$$
$$(y - 8)(y - 12) = 0$$

y = 8, 12
∴ y ≥ x

S2. Ans.(a)
Sol.
(i) $8x + 3y = 7$
(ii) $4x + 9y = 8.5$
Solving (i) and (ii)

$$x = \frac{5}{8} \& \ y = \frac{2}{3}$$

∴ y > x

S3. Ans.(b)
Sol.
(i) $6x^2 - 17x + 12 = 0$
$6x^2 - 8x - 9x + 12 = 0$

$$2x(3x - 4) - 3(3x - 4) = 0$$
$$(2x - 3)(3x - 4) = 0$$
$$x = \frac{3}{2}, \frac{4}{3}$$

(ii) $12y^2 - 17y + 6 = 0$
$12y^2 - 8y - 9y + 6 = 0$

$$4y(3y - 2) - 3(3y - 2) = 0$$
$$(4y - 3)(3y - 2) = 0$$
$$y = \frac{2}{3}, \frac{3}{4}$$

∴ x > y

S4. Ans.(e)
Sol.
(i) $5x^2 + 59x + 44 = 0$
$5x^2 + 4x + 55x + 44 = 0$

$$x(5x + 4) + 11(5x + 4) = 0$$
$$(x + 11)(5x + 4) = 0$$

$$x = \frac{-4}{5}, -11$$

(ii) $2y^2 + 13y + 15 = 0$
$2y^2 + 3y + 10y + 15 = 0$

$$y(2y + 3) + 5(2y + 3) = 0$$
$$(2y + 3)(y + 5) = 0$$
$$y = \frac{-3}{2}, -5$$

∴ No relation

S5. Ans.(c)
Sol.
(i) $x^2 - 36x + 315 = 0$
$x^2 - 15x - 21x + 315 = 0$

$$x(x - 15) - 21(x - 15) = 0$$
$$(x - 21)(x - 15) = 0$$

x = 15, 21
(ii) $y^2 - 23y + 120 = 0$

$$y^2 - 8y - 15y + 120 = 0$$
$$y(y - 8) - 15(y - 8) = 0$$
$$(y - 8)(y - 15) = 0$$

y = 8, 15
∴ x ≥ y

S6. Ans.(c)
Sol.
$302 \times 15 - 12 \times 260 + \sqrt{?} = (11)^3 + (9)^2$
$4530 - 3120 + \sqrt{?} = 1331 + 81$
$\sqrt{?} = 1331 - 4530 + 3120 + 81$
? = 4

S7. Ans.(c)
Sol.
$\frac{35}{100} \times 700 + \frac{25}{100} \times 256 = ?$
$? = 64 + 245$
$? = 309$

S8. Ans.(a)
Sol.
$\frac{7}{3} + \frac{27}{5} + \frac{13}{3} = ?$
$? = \frac{35 + 81 + 65}{15} = \frac{181}{15}$

S9. Ans.(e)
Sol.
$\frac{1024}{128}+\frac{34}{100}\times 350 =?^2+ 90 \div 15$
$?^2 = 8 + 17 \times 7 - 6$
$? = 11$

S10. Ans.(b)
Sol.
$\frac{67}{13}\times 338+? = 7^3 \times 3^2$
$? = 343 \times 9 - 67 \times 26$
$? = 3087 - 1742$
$? = 1345$

S11. Ans.(e)
Sol.
$x^2 - 5\sqrt{3}x - 3\sqrt{3}x + 45 = 0$
$x(x - 5\sqrt{3}) - 3\sqrt{3}(x - 5\sqrt{3}) = 0$
$$x = 3\sqrt{3}, 5\sqrt{3}$$
$y^2 - 4\sqrt{2}y + 3\sqrt{2}y - 24 = 0$
$$y(y - 4\sqrt{2}) + 3\sqrt{2}(y - 4\sqrt{2}) = 0$$
$$y = 4\sqrt{2}, -3\sqrt{2}$$
No relation can be established.

S12. Ans.(d)
Sol.
$12x^2 - 8x - 9x + 6 = 0$
$4x(3x - 2) - 3(3x - 2) = 0$
$$x = \frac{2}{3}, \frac{3}{4}$$
$20y^2 - 15y - 16y + 12 = 0$
$5y(4y - 3) - 4(4y - 3) = 0$
$$y = \frac{4}{5}, \frac{3}{4}$$
$x \leq y$

S13. Ans. (c)
Sol. $35x^2 - 25x - 28x + 20 = 0$
$$5x(7x - 5) - 4(7x - 5) = 0$$
$$x = \frac{4}{5}, \frac{5}{7}$$
$56y^2 - 49y - 48y + 42 = 0$
$7y(8y - 7) - 6(8y - 7) = 0$

$$y = \frac{6}{7}, \frac{7}{8}$$
$$x < y$$

S14. Ans. (b)
Sol. $x^2 - 7x + 2x - 14 = 0$

$$x(x-7) + 2(x-7) = 0$$
$$x = 7, -2$$
$$y^2 + 5y + 2y + 10 = 0$$
$$y = -2, -5$$
$$x \geq y$$

S15. Ans.(c)
Sol.

I. $14x^2 + 11x - 15 = 0$
$14x^2 + 21x - 10x - 15 = 0$
$7x(2x+3) - 5(2x+3) = 0$
$(7x-5)(2x+3)$
$x = \frac{-3}{2}, \frac{5}{7}$

II. $20y^2 - 31y + 12 = 0$
$20y^2 - 15y - 16y + 12 = 0$
$5y(4y-3) - 4(4y-3) = 0$
$(5y-4)(4y-3)$
$y = \frac{4}{5}, \frac{3}{4}$

$$y > x$$