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Quadratic Equation Questions for SBI PO Pre, IBPS PO Pre, SBI Clerk Mains and IBPS Clerk Mains Exams.

Quadratic Equation Quiz 5

Directions: In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer.

1. I. $x^2 - 37\sqrt{2}x + 140 = 0$
II. $y^2 + 13\sqrt{3}y + 120 = 0$

- A. if $x > y$ B. if $x \geq y$ C. if $x < y$ D. if $x \leq y$
E. if $x = y$ or relationship between x and y can't be established

2. I. $x^2 - 5\sqrt{2}x = 48$
II. $y^2 - 2\sqrt{2}y = 30$

- A. if $x > y$ B. if $x \geq y$ C. if $x < y$ D. if $x \leq y$
E. if $x = y$ or relationship between x and y can't be established

3. I. $2x^2 - 8x - 24 = 0$
II. $9y^2 - 12y + 4 = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
E. if $x = y$ or relationship between x and y can't be established

4. I. $6x^2 + 11x - 35 = 0$
II. $5y^2 - 2y - 9 = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
E. if $x = y$ or relationship between x and y can't be established

5. I. $5x^2 - 6x - 63 = 0$
II. $4y^2 + y - 39 = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
E. if $x = y$ or relationship between x and y can't be established

6. I. $x^2 - 24x + 135 = -8$
II. $y^2 + 17y - 31 = 7$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
E. if $x = y$ or relationship between x and y can't be established

7. I. $2x^2 - 21x + 34 = 0$
 II. $2y^2 - 19y + 44 = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
 E. if $x \leq y$ or no relationship can be established between x and y .

8. I. $8x^2 - 7x - 18 = 0$
 II. $y^2 - 8y + 15 = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
 E. if $x = y$ or relationship between x and y can't be established

9. I. $\frac{11}{\sqrt{x}} - \frac{3}{\sqrt{x}} = \sqrt{x}$
 II. $y^2 - \frac{13^{5/2}}{\sqrt{y}} = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
 E. if $x = y$ or relationship between x and y can't be established

10. I. $14x^2 + 9x - 8 = 0$
 II. $12y^2 - 25y + 7 = 0$

- A. if $x > y$ B. if $x < y$ C. if $x \geq y$ D. if $x \leq y$
 E. if $x = y$ or relationship between x and y can't be established

Correct Answers:

1	2	3	4	5	6	7	8	9	10
A	E	E	E	E	A	E	B	B	E

Explanations:

1. I. $x^2 - 37\sqrt{2}x + 140 = 0$

Step 1: Find the square of the root part of middle coefficient of the given equation:

$$\Rightarrow (\sqrt{2})^2 = 2$$

Step 2: Divide the constant part of the equation by the number we get at step 1:

$$\Rightarrow \frac{140}{2} = 70$$

Step 3: Find such factors of 70 that can give us the integer value of the middle coefficient; -37
Two such factors are -35 & -2 .

Step 4: The equation, therefore, can be written as

$$x^2 - 35\sqrt{2}x - 2\sqrt{2}x + 140 = 0$$

Step 5: Value of x , hence will be
either $+35\sqrt{2}$ or $+2\sqrt{2}$

Similarly, value of y will be

either $-8\sqrt{3}$ or $-5\sqrt{3}$

Now, we can observe that both the values of x are positive while those of y negative.

Therefore, $x > y$.

Hence, option A is correct.

2. I. $x^2 - 5\sqrt{2}x = 48$
 $= x^2 - 5\sqrt{2}x - 48 = 0$

Step 1: Find the square of the root part of middle coefficient of the given equation:

$$\Rightarrow (\sqrt{2})^2 = 2$$

Step 2: Divide the constant part of the equation by the number we get at step 1:

$$\Rightarrow \frac{48}{2} = 24$$

Step 3: Find such factors of 24 that can give us the integer value of the middle coefficient; -5
Two such factors are -8 & $+3$.

Step 4: The equation, therefore, can be written as

$$x^2 - 8\sqrt{2}x + 3\sqrt{2}x - 48 = 0$$

Step 5: Value of x , hence will be
either $+8\sqrt{2}$ or $-3\sqrt{2}$

Similarly, value of y will be

either $+5\sqrt{2}$ or $-3\sqrt{2}$

Now, in approximation we can assume the values of 2 to be 1.

Applying the comparison rule, we find that one of the values of y is lying between the value of x . So, we can't find the relation between them.

Hence, option E is correct.

3.

I. $2x^2 - 8x - 24 = 0$
 $\therefore x^2 - 4x - 12 = 0$
 $\therefore x^2 - 6x + 2x - 12 = 0$
 $\therefore (x + 2)(x - 6) = 0$
 $\therefore x = -2$ or $x = 6$

II. $9y^2 - 12y + 4 = 0$
 $\therefore 9y^2 - 6y - 6y + 4 = 0$
 $\therefore (3y - 2)(3y - 2) = 0$
 $\therefore y = \frac{2}{3}$

When $x = 6$, $x > y$ and when $x = -2$, $x < y$

Thus, the relationship between x and y can't be established.
Hence, option E is correct.

4. Since both equations are of the form $ax^2 \pm bx - c = 0$, both equations have one positive and one negative root.

Hence, the relation between x and y can't be established.

Hence, option E is correct.

5.

I. $5x^2 - 6x - 63 = 0$
 $\therefore 5x^2 + 15x - 21x - 63 = 0$
 $\therefore (5x - 21)(x + 3) = 0$
 $\therefore x = -3$ or $x = 21/5$

II. $4y^2 + y - 39 = 0$
 $\therefore 4y^2 - 12y + 13y - 39 = 0$
 $\therefore (4y + 13)(y - 3) = 0$
 $\therefore y = 3$ or $y = -13/4$

When $x = 21/5$, $x > y$

When $x = -3$ and $y = 3$, $x < y$

Hence, the relation between x and y cannot be established.

Hence, option E is correct.

6. I. $x^2 - 24x + 135 = -8$
 $\therefore x^2 - 24x + 143 = 0$
 $\therefore x^2 - 11x - 13x + 143 = 0$
 $\therefore (x - 13)(x - 11) = 0$
 $\therefore x = 13$ or $x = 11$

II. $y^2 + 17y - 31 = 7$
 $\therefore y^2 + 17y - 38 = 0$
 $\therefore y^2 + 19y - 2y - 38 = 0$
 $\therefore (y + 19)(y - 2) = 0$
 $\therefore y = 2$ or $y = -19$

For either value of x , $x > y$

Hence, option A is correct.

7. I. $2x^2 - 21x + 34 = 0$
 $\therefore 2x^2 - 4x - 17x + 34 = 0$
 $\therefore (x - 2)(2x - 17) = 0$
 $\therefore x = 2$ or $x = 17/2$ i.e. 8.5

II. $2y^2 - 19y + 44 = 0$
 $\therefore 2y^2 - 8y - 11y + 44 = 0$
 $\therefore (y - 4)(2y - 11) = 0$
 $\therefore y = 4$ or $y = 11/2$ i.e. 5.5

When $x = 8.5$, $x > y$

When $x = 2$, $x < y$

Hence, the relationship between x and y cannot be established.

Hence, option E is correct.

8. I. $8x^2 - 7x - 18 = 0$
or, $8x^2 - 16x + 9x - 18 = 0$
or, $(x - 2)(8x + 9) = 0$

or, $x = 2, -\frac{9}{8}$

II. $y^2 - 8y + 15 = 0$
or, $y^2 - 5y - 3y + 15 = 0$
or, $y(y - 5) - 3(y - 5) = 0$
or, $(y - 5)(y - 3) = 0$
or, $y = 3, 5$

Hence, $x < y$.

Hence, option B is correct.

9. I. $\frac{11}{\sqrt{x}} - \frac{3}{\sqrt{x}} = \sqrt{x}$

or, $11 - 3 = x$

or, $x = 8$

II. $y^2 - \frac{13^{5/2}}{\sqrt{y}} = 0$

or, $y^2 - \frac{13^{5/2}}{y^{1/2}} = 0$

or, $y^{2+0.5} - 13^{2.5} = 0$

or, $y^{2.5} = 13^{2.5}$

or, $y = 13$

Hence, $x < y$

Hence, option B is correct.

10. I. $14x^2 + 9x - 8 = 0$

or, $14x^2 - 7x + 16x - 8 = 0$

or, $7x(2x - 1) + 8(2x - 1) = 0$

or, $(7x + 8)(2x - 1) = 0$

or $x = -\frac{8}{7}, \frac{1}{2}$

II. $12y^2 - 25y + 7 = 0$

or, $12y^2 - 4y - 21y + 7 = 0$

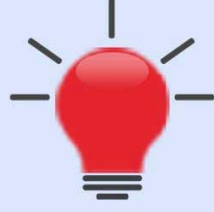
or, $4y(3y - 1) - 7(3y - 1) = 0$

or, $(4y - 7)(3y - 1) = 0$

or, $y = \frac{7}{4}, \frac{1}{3}$

While comparing the values of x and y , one root value of y lies between the root values of x

Hence, option E is correct.



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