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Quadratic Equation Questions for IBPS Clerk Pre, SBI Clerk, LIC Assistant RBI Assistant Exams.

Quadratic Equation Quiz 3

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.** $x^5 - 41x^3 + 400x = 0$ **II.** $y^2 - 14y + 30 = -18$

A.if x > y B. if x < y C. if x ≥ y D. if x ≤ y
E. if x = y or relationship between x and y can't be established

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2. **I.** $x^2 - 3 = 2x$ **II.** $y^2 + 5y + 6 = 0$

A. if x > y B. if x < y C. if x ≥ y D. if x ≤ y
E. if x = y or relationship between x and y can't be established

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3. **I.** $4x^3 + 24x^2 - 64x = 0$ **II.** $3y^2 + 39y + 126 = 0$

A. if x > y B. if x < y C. if x ≥ y D. if x ≤ y
E. if x = y or relationship between x and y can't be established

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4. **I.** $x^2 - 25x + 114 = 0$ **II.** $y^2 - 10y + 24 = 0$

A. if x > y B. if x < y C. if x ≥ y D. if x ≤ y
E. if x = y or relationship between x and y can't be established

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5. **I.** $48x^2 - 24x + 3 = 0$ **II.** $55y^2 + 53y + 12 = 0$

A. if x > y B. if x < y C. if x ≥ y D. if x ≤ y
E. if x = y or relationship between x and y can't be established

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6. **I.** $45x^2 + 17\sqrt{15x} + 24 = 0$ **II.** $y^2 + 7y + 12 = 0$

A. if x > y B. if x ≤ y C. if x ≥ y
D. if x < y E. if x = y or relationship between x and y can't be established

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7. **I.** $\frac{4}{\sqrt{x}} + \frac{6}{\sqrt{x}} = 5\sqrt{x}$ **II.** $y^2 + \sqrt{256} = \sqrt{625}$

A. if x > y B. if x < y C. if x ≤ y
D. if x = y or relationship between x and y can't be established E. if x ≥ y

8. I. $x^2 - 7\sqrt{3}x + 36 = 0$ II. $y^2 - 11\sqrt{3}y + 84 = 0$

A. if x > y
B. if x ≤ y
C. if x ≥ y
D. if x < y
E. if x = y or relationship between x and y can't be established

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9. I. $x^2 = 361$ II. $y^3 = 7269 + 731$

A. if x > y
B. if x ≤ y
C. if x < y
D. if x ≥ y
E. if x = y or relationship between x and y can't be established

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10. I. $x^2 + 5x + 6 = 0$ II. $y^2 - 4y - 12 = 0$

A. if x > y
B. if x ≤ y
C. if x ≥ y
D. if x = y or relationship between x and y can't be established
E. if x < y

Correct Answers:

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

Explanations:

1. **I.** $x^5 - 41x^3 + 400x = 0$

$\therefore x(x^4 - 41x^2 + 400) = 0$

$\therefore x = 0$ or $x^4 - 41x^2 + 400 = 0$

Let $x^2 = a$

$\therefore a^2 - 41a + 400 = 0$

$\therefore a^2 - 25a - 16a + 400 = 0$

$\therefore (a - 16)(a - 25) = 0$

$\therefore a = 16$ or $a = 25$

$\therefore x^2 = 16$ or $x^2 = 25$

$\therefore x = \pm 4$ or $x = \pm 5$

$\therefore x = -5$ or -4 or 0 or 4 or 5

II. $y^2 - 14y + 30 = -18$

$\therefore y^2 - 14y + 48 = 0$

$\therefore y^2 - 8y - 6y + 48 = 0$

$\therefore (y - 6)(y - 8) = 0$

$\therefore y = 6$ or $y = 8$

For both values of y, $x < y$

Hence, option B is correct.

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2. **I.** $x^2 - 3 = 2x$

$\therefore x^2 - 2x - 3 = 0$

$\therefore x^2 - 3x + x - 3 = 0$

$\therefore (x + 1)(x - 3) = 0$

$\therefore x = 3$ or $x = -1$

II. $y^2 + 5y + 6 = 0$

$\therefore y^2 + 3y + 2y + 6 = 0$

$\therefore (y + 3)(y + 2) = 0$

$\therefore y = -3$ or $y = -2$

For both values of x, $x > y$

Hence, option A is correct

3. **I.** $4x^3 + 24x^2 - 64x = 0$

$\therefore 4x(x^2 + 6x - 16) = 0$

$\therefore 4x = 0$ or $x^2 + 6x - 16 = 0$ (Here $4x = 0$ is nothing but $x = 0$)

$\therefore x^2 + 6x - 16 = 0$

$\therefore x^2 + 8x - 2x - 16 = 0 \therefore (x - 2)(x + 8) = 0$

$\therefore x = 2$ or $x = -8 \therefore x = -8, 0$ or 2

II. $3y^2 + 39y + 126 = 0$

$\therefore y^2 + 13y + 42 = 0$

$\therefore y^2 + 7y + 6y + 42 = 0 \therefore (y + 7)(y + 6) = 0$

$\therefore y = -7$ or $y = -6$ When $x = -8$, $x < y$

When $x = 0$ or 2, $x > y$

Hence, no relation can be established between x and y.

Hence, option E is correct.

4. **I.** $x^2 - 25x + 114 = 0$

$\therefore x^2 - 19x - 6x + 114 = 0$

$\therefore (x - 6)(x - 19) = 0$

$\therefore x = 19$ or $x = 6$

II. $y^2 - 10y + 24 = 0$

$\therefore y^2 - 6y - 4y + 24 = 0$

$\therefore (y - 4)(y - 6) = 0$

$\therefore y = 6$ or $y = 4$

When $x = 19$, $x > y$

When $x = 6$, $x \geq y$

Hence, $x \geq y$

Hence, option C is correct.

5. $48x^2 - 24x + 3 = 0$ is of the form $ax^2 - bx + c = 0$

Both roots of this equation are positive i.e. $x > 0$

$55y^2 + 53y + 12 = 0$ is of the form $ay^2 + by + c = 0$

Both roots of this equation are negative i.e. $y < 0$

Hence, $x > y$

Hence, option A is correct.

6. **I.** $45x^2 + 17\sqrt{15x} + 24 = 0$

$45x^2 + 9\sqrt{15x} + 8\sqrt{15x} + 24 = 0$

$3\sqrt{15x}\ (\sqrt{15x} + 3) + 8\ (\sqrt{15x} + 3) = 0$

$(\sqrt{15x} + 3)\ (3\sqrt{15x} + 8) = 0$

$x = -3/\sqrt{15}, -8/3\sqrt{15}$

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

$y^2 + 4y + 3y + 12 = 0$

$y\ (y + 4) + 3\ (y + 4) = 0$

$(y + 4)\ (y + 3) = 0$

$y = -4, -3$

$x > y$

Hence, option A is correct.

7. **I.** $\frac{4}{\sqrt{x}} + \frac{6}{\sqrt{x}} = 5\sqrt{x}$

or, $\frac{4 + 6}{\sqrt{x}} = 5\sqrt{x}$

$10 = 5x$

$x = 2$

II. $y^2 + \sqrt{256} = \sqrt{625}$

$y^2 + 16 = 25$

$y^2 = 25 - 16$

$y^2 = 9$

$y = \pm 3$

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

Hence, option D is correct.

8. **I.** $x^2 - 7\sqrt{3}\,x + 36 = 0$

$\Rightarrow x^2 - 4\sqrt{3}\,x - 3\sqrt{3}\,x + 36 = 0$

$\Rightarrow x\ (x - 4\sqrt{3}) - 3\sqrt{3}\ (x - 4\sqrt{3}) = 0$

$\Rightarrow (x - 3\sqrt{3})\ (x - 4\sqrt{3}) = 0$

$\therefore x = 3\sqrt{3}, 4\sqrt{3}$

II. $y^2 - 11\sqrt{3}\,y + 84 = 0$

$\Rightarrow y^2 - 4\sqrt{3}\,y - 7\sqrt{3}\,y + 84 = 0$

$\Rightarrow y\ (y - 4\sqrt{3}) - 7\sqrt{3}\ (y - 4\sqrt{3}) = 0$

$\Rightarrow (y - 7\sqrt{3})\ (y - 4\sqrt{3}) = 0$

$\therefore y = 7\sqrt{3}, 4\sqrt{3}$

Now, While comparing the root values of x and y

x		y
$3\sqrt{3}$	<	$4\sqrt{3}$
$3\sqrt{3}$	<	$7\sqrt{3}$
$4\sqrt{3}$	=	$4\sqrt{3}$
$4\sqrt{3}$	<	$7\sqrt{3}$

Here, $x \leq y$

Hence, option (B) is correct.

9. **I.** $x^2 = 361$

$x = \pm 19$

II. $y^3 = 7269 + 731$

$y^3 = 8000$

$y = 20$

$x < y$

Hence, option A is correct.

10. **I.** $x^2 + 5x + 6 = 0$

$\Rightarrow x^2 + 3x + 2x + 6 = 0$

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

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

$\therefore x = -2, -3$

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

$\Rightarrow y^2 - 6y + 2y - 12 = 0$

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

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

$\therefore y = -2, +6$

Now, While comparing the root values of x and y

x		y
-2	=	-2
-2	<	$+6$
-3	<	-2
-3	<	$+6$

Here, $x \leq y$

Hence, option (B) is correct.