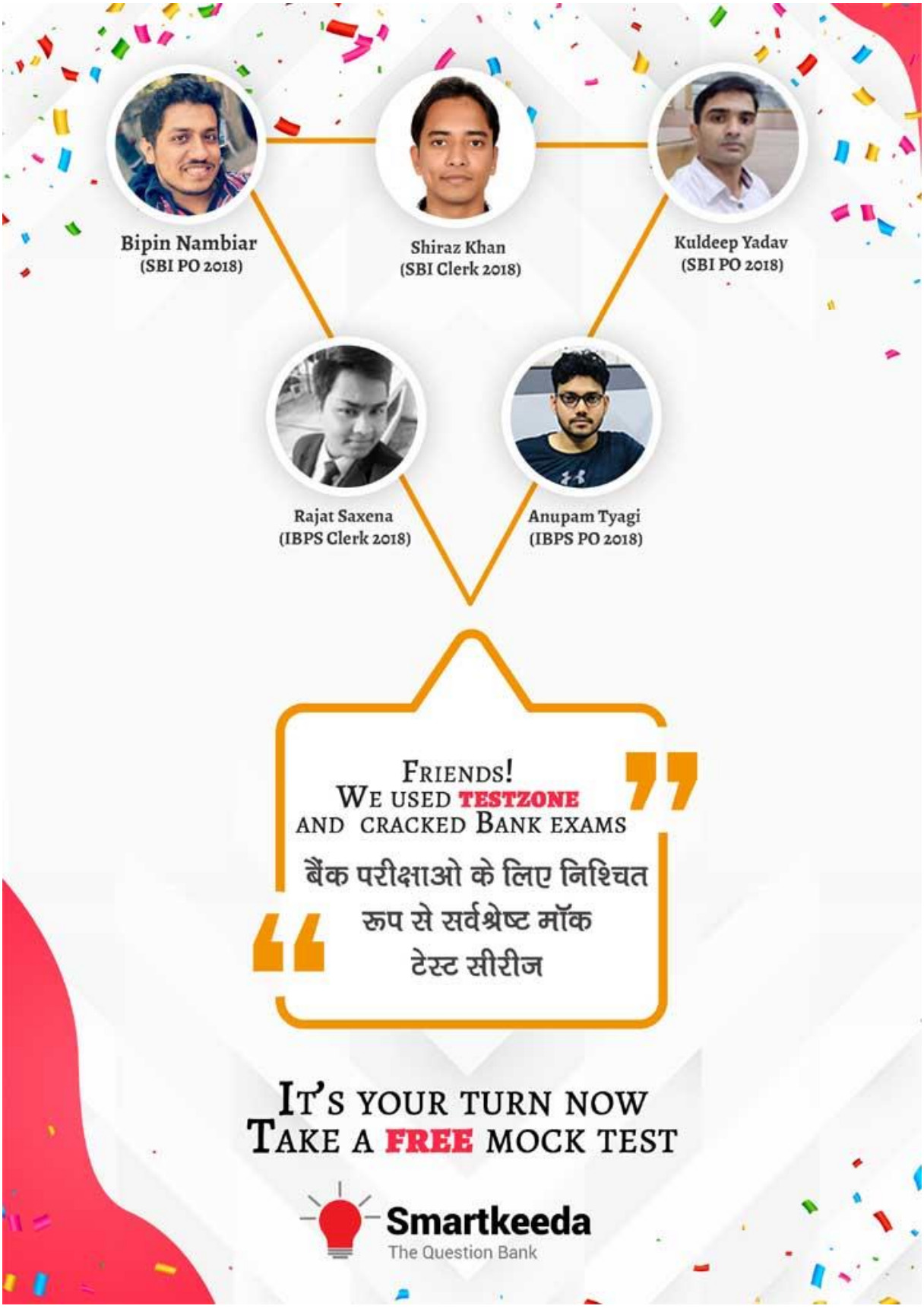
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The Question Bank

Quadratic Equation Questions for SBI Clerk Mains, IBPS Clerk Mains, RBI Assistant Mains, LIC AAO, SBI PO Pre, IBPS PO Pre and RRB Scale I Pre Exams.

Quadratic Eqn. Quiz 26

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. $\frac{x^2}{\sqrt{7} + 2\sqrt{2}} - x = 14\sqrt{2} - 8\sqrt{7}$

II. $y\sqrt{14} + \frac{35\sqrt{2}}{y} = 7\sqrt{2} + 5\sqrt{14}$

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

2. **I.** $3x^3 - 5y^3 = 2\sqrt{729}$
II. $2x^3 + (332 - 1088)y^3 + 92 = 0$

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

3.

I. $\frac{-(\sqrt{81} - \sqrt{25})x^2 + 60x + 2(\sqrt{25} + \sqrt{16})x}{270} = 1$

II. $y = \sqrt{18 + 0.5y}$

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

4.

I. $x^{3/2} - \frac{81}{\sqrt{x}} = 0$

II. $20y^2 - 119y + 176 = 0$

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

5. **I.** $76x^2 + 29\sqrt{19}x + 52 = 0$

II. $35y^2 + 8y - 3 = 0$

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

6. **I.** $4x^2 - (8 + \sqrt{10})x + 2\sqrt{10} = 0$

II. $2y^2 - (4 + 3\sqrt{11})y + 6\sqrt{11} = 0$

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

7. **I.** $x^3 \times 14 = x^2 \times 98$

II. $y^{1/3} \times 12 = 108 \div y^{2/3}$

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

8. **I.** $x^2 - 12x + 32 = 0$

II. $2y^2 - 9y + 10 = 0$

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

9. **I.** $x^2 + 3\sqrt{2}\,x - 80 = 0$

II. $y^2 - 5\sqrt{2}\,y - 100 = 0$

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

10. **I.** $x^2 - 4\sqrt{3}x - 36 = 0$

II. $y^2 - 5\sqrt{2}y - 72 = 0$

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

Correct Answers:

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

Explanations:

1.

I. $\frac{x^2}{\sqrt{7} + 2\sqrt{2}} - x = 14\sqrt{2} - 8\sqrt{7}$

$\Rightarrow x^2 - (\sqrt{7} + 2\sqrt{2})x = -2\sqrt{14}$

$\Rightarrow (x - \sqrt{7})(x - 2\sqrt{2}) = 0$

$\Rightarrow x = \sqrt{7}, 2\sqrt{2}$

II. $y\sqrt{14} + \frac{35\sqrt{2}}{y} = 7\sqrt{2} + 5\sqrt{14}$

Taking $\sqrt{14}$ common both sides we get,

$\Rightarrow y + \frac{5\sqrt{7}}{y} = \sqrt{7} + 5$

$\Rightarrow y^2 - (\sqrt{7} + 5)y + 5\sqrt{7} = 0$
$\Rightarrow (y - \sqrt{7})(y - 5) = 0$
$\Rightarrow y = \sqrt{7}, 5$
When $x = \sqrt{7}$ and $y = \sqrt{7}$, $x = y$
When $x = \sqrt{7}$ and $y = 5$, $x < y$
When $x = 2\sqrt{2}$ and $y = \sqrt{7}$, $x > y$

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

Hence, option (E) is correct.

2.

$3x^3 - 5y^3 = 2\sqrt{729}$
$\Rightarrow 3x^3 - 5y^3 = 54$
$\Rightarrow 5y^3 = 3x^3 - 54$ **.....(i)**
Now, $2x^3 + (33^2 - 1088)y^3 + 9^2 = 0$
$\Rightarrow 2x^3 + y^3 + 81 = 0$
Multiplying by 5 both sides we get,
$\Rightarrow 10x^3 + 5y^3 = -405$ **.....(ii)**
Put the value from eq. (i) in eq. (ii)
$\Rightarrow 10x^3 + 3x^3 - 54 = -405$
$\Rightarrow x^3 = -27 \Rightarrow x = -3$
Put the value of x in eq. (i)
$\Rightarrow 5y^3 = -81 - 54 \Rightarrow y = -3$
So, $x = y$
Hence, option (E) is correct.

3.

I. $\frac{-(\sqrt{81} - \sqrt{25})x^2 + 60x + 2(\sqrt{25} + \sqrt{16})x}{270} = 1$

$\Rightarrow \frac{-4x^2 + 60x + 18x}{270} = 1$

$\Rightarrow \frac{2x^2 - 30x - 9x}{2} = -\frac{135}{2}$

$\Rightarrow (x - 15)\left(x - \frac{9}{2}\right) = 0$

$\Rightarrow x = 15, \frac{9}{2}$

II. $y = \sqrt{18 + 0.5y}$
$\Rightarrow 10y^2 - 5y = 180$
$\Rightarrow 2y^2 - y - 36 = 0$
$\Rightarrow \left(y - \frac{9}{2}\right)(y + 4) = 0$

$\Rightarrow y = \frac{9}{2}, -4$

So, $x \geq y$
Hence, option (C) is correct.

4.

I. $x^{3/2} - \frac{81}{\sqrt{x}} = 0$

or, $\frac{(x^{3/2} \times \sqrt{x} - 81)}{\sqrt{x}} = 0$
$x^{3/2} \times x^{1/2} - 81 = 0$
$x^2 = 81$
$x = \pm 9$

II. $20y^2 - 119y + 176 = 0$
$20y^2 - 64y - 55y + 176 = 0$
$4y(5y - 16) - 11(5y - 16) = 0$
$(5y - 16)(4y - 11) = 0$
$y = \frac{16}{5}, \frac{11}{4}$
While comparing the values of x and y, both root values of y lies between the root values of x.
Hence, option E is correct.

5. **I.** $76x^2 + 29\sqrt{19}x + 52 = 0$

$76x^2 + 13\sqrt{19}x + 16\sqrt{19}x + 52 = 0$

$\sqrt{19}x(4\sqrt{19}x + 13) + 4(4\sqrt{19}x + 13) = 0$

$(4\sqrt{19}x + 13)(\sqrt{19}x + 4) = 0$

$x = -13/4\sqrt{19}, -4/\sqrt{19}$

II. $35y^2 + 8y - 3 = 0$

$35y^2 + 15y - 7y - 3 = 0$

$5y(7y + 3) - 1(7y + 3) = 0$

$(5y - 1)(7y + 3) = 0$

$y = 1/5, -3/7$

$x < y$

Hence, option D is correct.

6. **I.** $4x^2 - (8 + \sqrt{10})x + 2\sqrt{10} = 0$

$4x^2 - 8x - \sqrt{10}x + 2\sqrt{10} = 0$
$4x(x - 2) - \sqrt{10}(x - 2) = 0$
$(4x - \sqrt{10})(x - 2) = 0$

$x = 2, \frac{\sqrt{10}}{4}$

II. $2y^2 - (4 + 3\sqrt{11})y + 6\sqrt{11} = 0$
$= 2y^2 - 4y - 3\sqrt{11}y + 6\sqrt{11} = 0$
$= 2y(y - 2) - 3\sqrt{11}(y - 2) = 0$
$= (2y - 3\sqrt{11})(y - 2) = 0$

$y = 2, \frac{3\sqrt{11}}{2}$

While comparing the root the root values of x and y, we find that the root values of y is greater than equal to x.

Hence, the option D is correct.

7. **I.** $x^3 \times 14 = x^2 \times 98$

or, $\frac{x^3}{x^2} = \frac{98}{14}$

$\therefore$ $x = 7$

II. $y^{1/3} \times 12 = 108 \div y^{2/3}$

or, $y^{1/3} \times y^{2/3} = \frac{108}{12}$

or, $y = 9$

Clearly, $x < y$

Hence, the option C is correct.

8. **I.** $x^2 - 12x + 32 = 0$

or, $x^2 - 8x - 4x + 32 = 0$

or, $x(x - 8) - 4(x - 8) = 0$

or, $(x - 4)(x - 8) = 0$

$\therefore$ $x = 4, 8$

II. $2y^2 - 9y + 10 = 0$

or, $2y^2 - 4y - 5y + 10 = 0$

or, $2y(y - 2) - 5(y - 2) = 0$

or, $(2y - 5)(y - 2) = 0$

$\therefore$ $y = \frac{5}{2}, 2$

Clearly, $x > y$.

Hence, the option A is correct.

9. **Step I:** Find the square of the root part of middle cofficient of the given equation:

$x^2 + 3\sqrt{2}\ x - 80 = 0$

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

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

$\Rightarrow \frac{80}{2} = 40$

Step 3: Find such factors of 40 that can give us the integer value of the middle cofficient; +3

Two such factors are +8 & –5

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

$x^2 + 8\sqrt{2} - 5\sqrt{2} - 80 = 0$

Step 5: Value of x, hence will be

either $-8\sqrt{2}$ or $+ 5\sqrt{2}$

Similarly, value of y will be

either $+10\sqrt{2}$ and $-5\sqrt{2}$.

Now, in approximation we can assume the value of $\sqrt{2}$ to be 1.

Applying the comparison rule,

$-8 < +5$
$-9 < -5$
$-5 < 5$
$5 > -3$

Therefore, the relation between x and y can't be determined.
Hence option E is correct.

10. **Step 1:** Find the square of the root part of middle cofficient of the given equation:

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

$\Rightarrow (\sqrt{3})^2 = 3$

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

$\Rightarrow \frac{36}{3} = 12$

Step 3: Find such factors of 12 that can give us the integer value of the middle cofficient; – 4

Two such factors are –6 & +2.

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

$x^2 - 6\sqrt{3}x + 2\sqrt{3}x - 36 = 0$

Step 5: Value of x, hence will be

either $+6\sqrt{3}$ or $-2\sqrt{3}$

Similarly, value of y will be

Either $+9\sqrt{2}$ or $-4\sqrt{2}$

Now, in approximation we can assume the values of $\sqrt{2}$ and $\sqrt{3}$ to be 1.

Applying the comparison rule, we find that $-2\sqrt{2}$ (one of the values of y) is lying between $+6\sqrt{3}$ and $-2\sqrt{3}$ (which are roots of x).

Therefore, the relation between x and y can't be determined.

Hence option E is correct.