Quadratic equation questions for IBPS PO pre, IBPS clerk, SBI PO pre and SBI clerk exams

QUADRATIC EQUATIONS QUIZ 15

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.** $3x^2 - 20x + 12 = 0$

II. $4y^2 - 13y - 12 = 0$

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

(2). **I.** $7x^2 - 16x - 15 = 0$

II. $5y^2 - 4y - 12 = 0$

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

(3). **I.** $9x^2 - 24x + 16 = 0$

II. $\frac{1}{y^{1/3}} - \frac{1}{y^{2/3}} = 5y^{-2/3}$

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

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

II. $\sqrt{16}\, y^2 = \sqrt{10^2 - 19}$

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.** $20x^2 - 119x + 176 = 0$

II. $\frac{6y^3 - 13y^2 - 10y + 24}{3y + 4} = 0$

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.** $5x^2 + 15x + \frac{50}{4} = \frac{5}{4}$

II. $12y^2 + 18y = 0$

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.** $x^2 - 200x + 6400 = 0$

II. $y^2 - 200y + 8400 = 0$

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

(8). **I.** $3x^2 - (6 + \sqrt{5})x + 2\sqrt{5} = 0$

II. $8y^2 - (16 + 3\sqrt{5})y + 6\sqrt{5} = 0$

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.** $3x^2 - 13\sqrt{2}x + 24 = 0$

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

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

(10). I. $36x^2 - 216x + 288 = 0$

II. $156y^2 - 1092y + 1560 = 0$

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	D	E	A	B	E	E	E	E

Explanations:

1.

I. $3x^2 - 20x + 12 = 0$

$\Rightarrow 3x^2 - 18x - 2x + 12 = 0$

$\Rightarrow 3x(x - 6) - 2(x - 6) = 0$

$\Rightarrow (x - 6)(3x - 2) = 0$

$\Rightarrow x = 6, \frac{2}{3}$

II. $4y^2 - 13y - 12 = 0$

$\Rightarrow 4y^2 - 16y + 3y - 12 = 0$

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

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

$y = 4, \frac{-3}{4}$

When x = 6 is compared with both roots of y then x > y.

When x = 2/3 is compared with both roots of y then we cannot say about the relation as one root of y is greater than 2/3 and the other is less.

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

Hence, option (E) is correct.

2.

I. $7x^2 - 16x - 15 = 0$

$\Rightarrow 7x^2 - 21x + 5x - 15 = 0$

$\Rightarrow 7x(x - 3) + 5(x - 3) = 0$

$(7x + 5)(x - 3) = 0$

$x = 3, \frac{-5}{7}$

II. $5y^2 - 4y - 12 = 0$

$\Rightarrow 5y^2 - 10y + 6y - 12 = 0$

$\Rightarrow 5y(y - 2) + 6(y - 2) = 0$

$\Rightarrow (y - 2)(5y + 6) = 0$

$\Rightarrow y = 2, \frac{-6}{5}$

While comparing the root values of x and y, we find that one root value of y lies between the root values of x. Therefore the relation between x and y can't be determined.

Hence, option (E) is correct.

3.

I. $9x^2 - 24x + 16 = 0$

$\Rightarrow 9x^2 - 12x - 12x + 16 = 0$

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

$(3x - 4)(3x - 4) = 0$

$x = \frac{4}{3}$

II. $\frac{1}{y^{1/3}} - \frac{1}{y^{2/3}} = 5y^{-2/3}$

$\Rightarrow y^{2/3} - y^{1/3} = 5 \times y^{-2/3} \times y^{1/3} \times y^{2/3}$

$\Rightarrow y^{1/3} \times (y^{1/3} - 1) = 5y^{1/3}$

$\Rightarrow 5y^{1/3} - y^{1/3} \times (y^{1/3} - 1) = 0$

$\Rightarrow y^{1/3} \times (5 - y^{1/3} + 1) = 0$

$\Rightarrow y^{1/3} = 0$ and $y^{1/3} = 6$

$\Rightarrow y = 0, 216$

But y can't be 0 because if we put 0 in the equation the value becomes undefined. So the possible value of y is 216.

So the root of y is greater than x.

Hence, option (D) 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. $\sqrt{16}\, y^2 = \sqrt{102 - 19} \Rightarrow \sqrt{16}\, y^2 = \sqrt{81}$

$\Rightarrow y^2 = \frac{\sqrt{81}}{16}$

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

While comparing the root values of x and y, we find that one root values of y lies between the root values of x. Therefore the relation between x and y can't be determined.

Hence, option (E) is correct.

5.

I. $20x^2 - 119x + 176 = 0$

$20x^2 - 64x - 55x + 176 = 0$

$4x(5x - 16) - 11(5x - 16) = 0$

$(5x - 16)(4x - 11) = 0$

$x = \frac{16}{5}, \frac{11}{4}$

II. $\frac{6y^3 - 13y^2 - 10y + 24}{3y + 4} = 0$

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

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

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

While comparing the values of x and y, both root values of y is less than the root values of x.

Hence, option A is correct.

6.

I. $5x^2 + 15x + \frac{50}{4} = \frac{5}{4}$

$5x^2 + 15x + \frac{45}{4} = 0$

$x^2 + 3x + \frac{9}{4} = 0$

$(x + \frac{3}{2})^2 = 0$

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

II. $12y^2 + 18y = 0$

$6y(2y + 3) = 0$

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

Therefore, $x \leq y$

Hence, option B is correct.

7.

I. $x^2 - 200x + 6400 = 0$

$x^2 - 40x - 160x + 6400 = 0$

$x(x - 40) - 160(x - 40) = 0$

$(x - 40)(x - 160) = 0$

$x = 40, 160$

II. $y^2 - 200y + 8400 = 0$

$y^2 - 60y - 140y + 8400 = 0$

$y(y - 60) - 140(y - 60) = 0$

$(y - 60)(y - 140) = 0$

$y = 60, 140$

The relationship between x and y cannot be established.

Hence, option E is correct.

8.

I. $3x^2 - (6 + \sqrt{5})x + 2\sqrt{5} = 0$

or, $3x^2 - 6x - \sqrt{5}x + 2\sqrt{5} = 0$

or, $3x(x-2)-\sqrt{5}(x-2)=0$

or, $(3x-\sqrt{5})(x-2)=0$

or, $x=\sqrt{5}/3, 2$

II. $8y^2-(16+3\sqrt{5})y+6\sqrt{5}=0$

or, $8y^2-16y-3\sqrt{5}y+6\sqrt{5}=0$

or, $8y(y-2)-3\sqrt{5}(y-2)=0$

or, $(8y-3\sqrt{5})(y-2)=0$

or, $y=3\sqrt{5}/8,\ 2$

While comparing the root values of x and y, we find that one root value of x lies between the roots of y. Hence, the relation between x and y can't be established.

Hence, option E is correct.

9.

I. $3x^2-13\sqrt{2}x+24=0$

$3x^2-9\sqrt{2}x-4\sqrt{2}x+24=0$

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

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

$x=\frac{4}{3}\sqrt{2}, 3\sqrt{2}$

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

$y^2 – √2y – 3√2y + 6 = 0$

$y(y – √2) – 3√2 (y – √2) = 0$

$(y – √2) (y – 3√2) = 0$

$Y = √2, 3√2$

∴ The relationship between x and y cannot be established

Hence, option E is correct.

10.

I. $36x^2 – 216x + 288 = 0$

$36x^2 – 144x – 72x + 288 = 0$

$36x(x – 4) – 72(x – 4) = 0$

$(36x – 72)(x – 4) = 0$

$x = 2, 4$

II. $156y^2 – 1092y + 1560 = 0$

$156y^2 – 312y – 780y + 1560 = 0$

$156y (y – 2) – 780 (y – 2) = 0$

$(156y – 780)(y – 2) = 0$

$y = 5, 2$

∴ The relationship between x and y cannot be established

Hence, option E is correct.