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

Quadratic equation Quiz 13

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

(1). I. $15x^2 - 23x + 6 = 0$

II. $6y^2 + 23y + 40 = 18$

A. if $x > y$

B. if $x < y$

C. if $x \geq y$

D. if $x \leq y$

E. if the relation cannot be established

(2). 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 the relation cannot be established

(3). I. $x^2 - 14x + 48 = 0$

II. $y^2 - 23y + 90 = 0$

A. if $x > y$

B. if $x < y$

C. if $x \geq y$

D. if $x \leq y$

E. if the relation cannot be established

(4). 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 the relation cannot be established

(5). I. $8x^2 + 10x - 7 = 0$

II. $y^2 - 6y + 8 = 0$

A. if $x > y$

B. if $x < y$

C. if $x \geq y$

D. if $x \leq y$

E. if the relation cannot be established

(6). I. $3x^2 + 27x + 60 = 0$

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

A. if $x > y$

B. if $x \leq y$

C. if $x \geq y$

D. if $x < y$

E. if $x = y$ or relationship between x and y can't be established

(7). I. $4x^2 - 52x + 133 = 0$

II. $4y^2 - 24y + 35 = 0$

A. if $x > y$

B. if $x \leq y$

C. if $x \geq y$

D. if $x < y$

E. if $x = y$ or relationship between x and y can't be established

(8). I. $x^2 + 11x + 30 = 0$

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

A. if $x > y$

B. if $x \leq y$

C. if $x \geq y$

D. if $x < y$

E. if $x = y$ or relationship between x and y can't be established

(9). I. $x^2 + x - 72 = 0$

II. $2y^2 + 21y + 27 = 0$

A. if $x > y$

B. if $x \leq y$

C. if $x \geq y$

D. if $x < y$

E. if $x = y$ or relationship between x and y can't be established

(10). I. $x^2 + 15x + 56 = 0$

II. $2y^2 + 17y + 35 = 0$

A. if $x > y$

B. if $x \leq y$

C. if $x \geq y$

D. if $x < y$

E. if $x = y$ or relationship between x and y can't be established



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Correct answers:

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

Explanations:

1.

$$15x^2 - 23x + 6 = 0 \text{ is of the form } ax^2 - bx + c = 0$$

Hence, both roots of this equation are positive i.e. $x > 0$

$$6y^2 + 23y + 40 = 18$$

$$\therefore 6y^2 + 23y + 22 = 0$$

This equation is of the form $ay^2 + by + c = 0$

Hence, both roots of this equation are negative i.e. $y < 0$

Hence, $x > y$

Hence, option A is correct.

2.

$$\text{I. } 5x^2 - 6x - 63 = 0$$

$$\therefore 5x^2 + 15x - 21x - 63 = 0$$

$$\therefore (5x - 21)(x + 3) = 0$$

$$\therefore x = -3 \text{ or } x = 21/5$$

$$\text{II. } 4y^2 + y - 39 = 0$$

$$\therefore 4y^2 - 12y + 13y - 39 = 0$$

$$\therefore (4y + 13)(y - 3) = 0$$

$$\therefore y = 3 \text{ or } y = -13/4$$

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..

3.

$$\text{I. } x^2 - 14x + 48 = 0$$

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

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

$$\therefore x = 6 \text{ or } x = 8$$

$$\text{II. } y^2 - 23y + 90 = 0$$

$$\therefore y^2 - 18y - 5y + 90 = 0$$

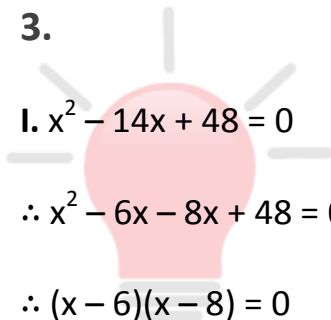
$$\therefore (y - 18)(y - 5) = 0$$

$$\therefore y = 18 \text{ or } y = 5$$

When $y = 18$, $y > x$

When $y = 5$, $y < x$

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



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Hence, option E is correct.

4.

$$\text{I. } x^2 - 24x + 135 = -8$$

$$\therefore x^2 - 24x + 143 = 0$$

$$\therefore x^2 - 11x - 13x + 143 = 0$$

$$\therefore (x - 13)(x - 11) = 0$$

$$\therefore x = 13 \text{ or } x = 11$$

$$\text{II. } y^2 + 17y - 31 = 7$$

$$\therefore y^2 + 17y - 38 = 0$$

$$\therefore y^2 + 19y - 2y - 38 = 0$$

$$\therefore (y + 19)(y - 2) = 0$$

$$\therefore y = 2 \text{ or } y = -19$$

For either value of x , $x > y$

Hence, option A is correct..

5.

$$\text{I. } 8x^2 + 10x - 7 = 0$$

$$\therefore 8x^2 - 4x + 14x - 7 = 0$$

$$\therefore (4x + 7)(2x - 1) = 0$$

$$\therefore x = -7/4 \text{ or } x = 1/2$$

$$\text{II. } y^2 - 6y + 8 = 0$$

$$\therefore y^2 - 4y - 2y + 8 = 0$$

$$\therefore (y - 2)(y - 4) = 0$$

$$\therefore y = 4 \text{ or } y = 2$$

Since $1/2 < 1$, $y > x$ for all values.

Hence, option B is correct..

6.

$$\text{I. } 3x^2 + 27x + 60 = 0$$

$$3x^2 + 15x + 12x + 60 = 0$$

$$x(3x + 15) + 4(3x + 15) = 0$$

$$(3x + 15)(x + 4) = 0$$

$$x = -5, -4$$

$$\text{II. } y^2 - 2y - 24 = 0$$

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

$$y(y - 6) + 4(4 - 6) = 0$$

$$(y + 4)(y - 6) = 0$$

$$y = -4, 6$$



For $x = -4$ and $y = -4$, $x = y$

For $x = -4$ or -5 , and $y = 6$ $x < y$

Therefore, $x \leq y$

Hence, option B is correct.

7.

I. $4x^2 - 52x + 133 = 0$

$$4x^2 - 14x - 38x + 133 = 0$$

$$2x(2x - 7) - 19(2x - 7) = 0$$

$$(2x - 7)(2x - 19) = 0$$

$$x = 9.5, 3.5$$

II. $4y^2 - 24y + 35 = 0$

$$4y^2 - 14y - 10y + 35 = 0$$

$$2y(2y - 7) - 5(2y - 7) = 0$$

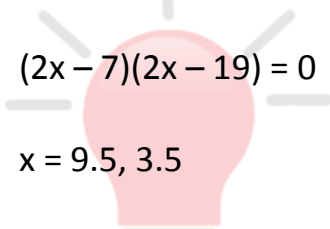
$$(2y - 5)(2y - 7) = 0$$

$$y = 3.5, 2.5$$

For $x = 3.5$, and $y = 3.5$ $x = y$

For $x = 3.5$, or 9.5 and $y = 2.5$

$x > y$



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Therefore, $x \geq y$

Hence, option C is correct.

8.

I. $x^2 + 11x + 30 = 0$

$$x^2 + 5x + 6x + 30 = 0$$

$$x(x + 5) + 6(x + 5) = 0$$

$$(x + 5)(x + 6) = 0$$

$$x = -6, -5$$

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

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

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

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

$$y = -4, -3$$

For $x = -4$ or -6 and $y = -4$ or -3 , $x < y$

Therefore, $x < y$

Hence, option D is correct.

9.

I. $x^2 + x - 72 = 0$



$$x^2 + 9x - 8x - 72 = 0$$

$$x(x + 9) - 8(x + 9) = 0$$

$$(x + 9)(x - 8) = 0$$

$$x = -9, 8$$

$$\text{II. } 2y^2 + 21y + 27 = 0$$

$$2y^2 + 3y + 18y + 27 = 0$$

$$y(2y + 3) + 9(2y + 3) = 0$$

$$(2y + 3)(y + 9) = 0$$

$$y = -1.5, -9$$

$$\text{For, } x = -9 \text{ and } y = -9 \quad x = y$$

$$\text{For, } x = 8 \text{ and } y = -1.5 \quad x > y$$

$$\text{For } x = 8, \text{ and } y = -9 \quad x > y$$

$$\text{For } x = -9 \text{ and } y = -1.5 \quad x < y$$

Therefore, relation can't be established

Hence, option E is correct.

10.

$$\text{I. } x^2 + 15x + 56 = 0$$

$$x^2 + 8x + 7x + 56 = 0$$

$$x(x + 8) + 7(x + 8) = 0$$

$$(x + 8)(x + 7) = 0$$

$$x = -7, -8$$

$$\text{II. } 2y^2 + 17y + 35 = 0$$

$$2y^2 + 7y + 10y + 35 = 0$$

$$y(2y + 7) + 5(2y + 7) = 0$$

$$(y + 5)(2y + 7) = 0$$

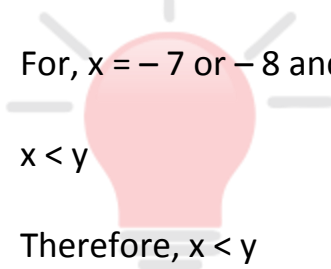
$$y = -5, -3.5$$

For, $x = -7$ or -8 and $y = -5$ or -3.5

$$x < y$$

Therefore, $x < y$

Hence, option D is correct.



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