Date : 5th Jan 2024 **Quantitative Aptitude - Quadratic Equations** English

Q:1 Directions: In each of these questions, two equations I and II are given. You have to solve both equations and give an answer.
I. $72x^2 - 101x + 35 = 0$
II. $45y^2 - 62y + 21 = 0$
1. $x > y$
2. $x < y$
3. $x \geq y$
4. $x \leq y$
5. x = y or relationship between x and y can't be established.

Q:2 Direction: In each of these questions, two equations (I) and (II) are given. You have to solve both equations and mark the appropriate answer.
I. $3x^2 - 8x - 16 = 0$
II. $3y^2 - 19y + 28 = 0$
1. $x > y$
2. $x < y$
3. $x \leq y$
4. $x \geq y$
5. x = y or Relationship between x and y can't be established.

Q:3 Directions: In each of these questions, two equations I and II are given. You have to solve both equations and give an answer.
I. $x^2 = 361$
II. $y^3 = 7269 + 731$
1. $x > y$
2. $x < y$
3. $x \leq y$
4. $x \geq y$
5. x = y or relationship between x and y can't be established.

Q:4 Directions: In each of these questions, two equations I and II are given. You have to solve both equations and give an answer.
I. $21/\sqrt{x} + 11/\sqrt{x} = 7\sqrt{x}$
II. $2y^2 - 11y + 12 = 0$
1. $x > y$
2. $x < y$
3. $x \geq y$
4. $x \leq y$
5. x = y or relationship between x and y can't be established.

Q:5 Directions: In each of these questions, two equations I and II are given. You have to solve both equations and give an answer.
I. $48x^2 - 24x + 3 = 0$
II. $55y^2 + 53y + 12 = 0$
1. $x > y$
2. $x < y$
3. $x \geq y$
4. $x \leq y$
5. x = y or relationship between x and y can't be established.

Q:6 Direction: In each of these questions, two equations (I) and (II) are given. You have to solve both equations and mark the appropriate answer.
I. $3x^2 - 26x + 56 = 0$
II. $3y^2 - 35y + 98 = 0$
1. $x > y$
2. $x \geq y$
3. $x < y$
4. $x \leq y$
5. x = y or Relationship between x and y cannot be determined

Q:7 Direction: In each of these questions, two equations (I) and (II) are given. You have to solve both equations and mark the appropriate answer.
I. $5x^2 + 17x - 12 = 0$
II. $3y^2 - 8y - 16 = 0$
1. $x > y$
2. $x \geq y$
3. $x < y$
4. $x \leq y$
5. x = y or Relationship between x and y cannot be determined

Q:8 Direction: In each of these questions, two equations (I) and (II) are given. You have to solve both equations and mark the appropriate answer.
I. $8x^2 - 95x + 77 = 0$
II. $8y^2 + 45y + 52 = 0$
1. $x > y$
2. $x \geq y$
3. $x < y$
4. $x \leq y$
5. x = y or Relationship between x and y cannot be determined

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Q:9 Direction: In each of these questions, two equations (I) and (II) are given. You have to solve both equations and mark the appropriate answer.

I. $5x^2 - 77x + 156 = 0$

II. $25y^2 - 110y + 120 = 0$

1. $x > y$

2. $x \geq y$

3. $x < y$

4. $x \leq y$

5. $x = y$ or Relationship between x and y cannot be determined

Q:10 Direction: In each of these questions, two equations (I) and (II) are given. You have to solve both equations and mark the appropriate answer.

I. $4x^2 - 13x - 35 = 0$

II. $2y^2 - 31y + 99 = 0$

1. $x > y$

2. $x \geq y$

3. $x < y$

4. $x \leq y$

5. $x = y$ or Relationship between x and y cannot be determined

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Answer Key

1. (5)	**2.** (5)	**3.** (2)	**4.** (1)	**5.** (1)
6. (4)	**7.** (5)	**8.** (1)	**9.** (2)	**10.** (5)

Answers and Solutions

Q:1 The correct answer is **option 5** i.e. **x = y or relationship between x and y can't be established.**

Equation I
$72x^2 - 101x + 35 = 0$
or, $72x^2 - 56x - 45x + 35 = 0$
$8x(9x - 7) - 5(9x - 7) = 0$
$(8x - 5)(9x - 7) = 0$
$x = 5/8, 7/9$

Equation II
$45y^2 - 62y + 21 = 0$
$45y^2 - 35y - 27y + 21 = 0$
$5y(9y - 7) - 3(9y - 7) = 0$
$(5y - 3)(9y - 7) = 0$
$y = 3/5, 7/9$

We can analyse,

Value of x	Value of y	Result
5/8	3/5	x > y
5/8	7/9	x < y
7/9	3/5	x > y
7/9	7/9	x = y

Hence, **x = y or relationship between x and y can't be established.**

Q:2 The correct answer is **option 5** i.e. **x = y or relationship between x and y can't be established.**

Equation I
$3x^2 - 8x - 16 = 0$
$3x^2 - 12x + 4x - 16 = 0$
$3x(x - 4) + 4(x - 4) = 0$
$(3x + 4)(x - 4) = 0$
$x = -4/3, 4$

Equation II
$3y^2 - 19y + 28 = 0$
$3y^2 - 12y - 7y + 28 = 0$
$3y(y - 4) - 7(y - 4) = 0$
$(3y - 7)(y - 4) = 0$
$y = 7/3, 4$

We can analyse,

Value of x	Value of y	Result
-4/3	7/3	x < y
-4/3	4	x < y
4	7/3	x > y
4	4	x = y

Hence, **x = y or relationship between x and y can't be established.**

Q:3 The correct answer is **option 2** i.e. **x < y.**

Equation I
$x^2 = 361$
$x = +19$
$x = -19$

Equation II
$y^3 = 7269 + 731$
$y^3 = 8000$
$y = 20$

We can analyse,

Value of x	Value of y	Result
+19	20	x < y
-19	20	x < y

Hence, **x < y.**

Q:4 The correct answer is **option 1** i.e. **x > y.**

Equation I
$21/\sqrt{x} + 11/\sqrt{x} = 7\sqrt{x}$
$(21 + 11)/\sqrt{x} = 7\sqrt{x}$
$32/\sqrt{x} = 7\sqrt{x}$
$x = 32/7$
$x = 32/7$

Equation II
$2y^2 - 11y + 12 = 0$
$2y^2 - 8y - 3y + 12 = 0$
$2y(y - 4) - 3(y - 4) = 0$
$(2y - 3)(y - 4) = 0$
$y = 3/2, 4$

We can analyse,

Value of x	Value of y	Result
32/7	3/2	x > y
32/7	4	x > y

Hence, **x > y.**

Q:5 The correct answer is **option 1** i.e. **x > y.**

Equation I
$48x^2 - 24x + 3 = 0$
$48x^2 - 12x - 12x + 3 = 0$
$12x(4x - 1) - 3(4x - 1) = 0$
$(12x - 3)(4x - 1) = 0$
$x = 1/4, 1/4$

Equation II
$55y^2 + 53y + 12 = 0$
$55y^2 + 33y + 20y + 12 = 0$

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$11y(5y + 3) + 4(5y + 3) = 0$
$(11y + 4)(5y + 3) = 0$
$y = -4/11, -3/5$
We can analyse,

Value of x	Value of y	Result
1/4	-4/11	x > y
1/4	-4/11	x > y
1/4	-3/5	x > y
1/4	-3/5	x > y

Hence, **x > y.**

Q:6 The correct answer is **Option 4** i.e. **x ≤ y**
Equation I
$3x^2 - 26x + 56 = 0$
$3x^2 - 12x - 14x + 56 = 0$
$3x(x - 4) - 14(x - 4) = 0$
$(3x - 14)(x - 4) = 0$
$x = 14/3, 4$
Equation II
$3y^2 - 35y + 98 = 0$
$3y^2 - 21y - 14y + 98 = 0$
$3y(y - 7) - 14(y - 7) = 0$
$(3y - 14)(y - 7) = 0$
$y = 14/3, 7$
We can analyse,

Value of x	Value of y	Result
14/3	14/3	x = y
14/3	7	x < y
4	14/3	x < y
4	7	x < y

Hence, x ≤ y

Q:7 The correct answer is **option 5** i.e. **x = y or Relationship between x and y cannot be determined**
Equation I
$5x^2 + 17x - 12 = 0$
$5x^2 + 20x - 3x - 12 = 0$
$5x(x + 4) - 3(x + 4) = 0$
$(5x - 3)(x + 4) = 0$
$x = 3/5, -4$
Equation II
$3y^2 - 8y - 16 = 0$
$3y^2 - 12y + 4y - 16 = 0$
$3y(y - 4) + 4(y - 4) = 0$
$(3y + 4)(y - 4) = 0$
$y = -4/3, 4$
We can analyse,

Value of x	Value of y	Result
3/5	-4/3	x > y
3/5	4	x < y
-4	-4/3	x < y
-4	4	x < y

Hence, x = y or Relationship between x and y cannot be determined

Q:8 The correct answer is **Option 1** i.e. **x > y**
Equation I
$8x^2 - 95x + 77 = 0$
$8x^2 - 88x - 7x + 77 = 0$
$8x(x - 11) - 7(x - 11) = 0$
$(8x - 7)(x - 11) = 0$
$x = 11, 7/8$
Equation II
$8y^2 + 45y + 52 = 0$
$8y^2 + 32y + 13y + 52 = 0$
$8y(y + 4) + 13(y + 4) = 0$
$(8y + 13)(y + 4) = 0$
$y = -13/8, -4$
We can analyse,

Value of x	Value of y	Result
11	-13/8	x > y
11	-4	x > y
7/8	-13/8	x > y
7/8	-4	x > y

Hence, x > y

Q:9 The correct answer is **Option 2** i.e. **x ≥ y**
Equation I
$5x^2 - 77x + 156 = 0$
$5x^2 - 65x - 12x + 156 = 0$
$5x(x - 13) - 12(x - 13) = 0$
$(5x - 12)(x - 13) = 0$
$x = 13, 12/5$
Equation II
$25y^2 - 110y + 120 = 0$
$5y^2 - 22y + 24 = 0$
$5y^2 - 10y - 12y + 24 = 0$
$(5y - 12)(y - 2) = 0$
$y = 2, 12/5$
We can analyse,

Value of x	Value of y	Result
13	2	x > y
13	12/5	x > y
12/5	2	x > y
12/5	12/5	x = y

Hence, x ≥ y

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Q:10 The correct answer is **option 5** i.e. **x = y or the Relationship between x and y cannot be determined.**

Equation I

$4x^2 - 13x - 35 = 0$

$4x^2 - 20x + 7x - 35 = 0$

$4x(x - 5) + 7(x - 5) = 0$

$(4x + 7)(x - 5) = 0$

$x = -7/4, 5$

Equation II

$2y^2 - 31y + 99 = 0$

$2y^2 - 22y - 9y + 99 = 0$

$2y(y - 11) - 9(y - 11) = 0$

$(y - 11)(2y - 9) = 0$

$y = 11, 9/2$

We can analyse,

Value of x	Value of y	Result
-7/4	11	x < y
-7/4	9/2	x < y
5	11	x < y
5	9/2	x > y

Hence, x = y or Relationship between x and y cannot be determined.

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