Date : 5th Dec 2023 **Quantitative Aptitude - Quadratic Equations** English

**Q:1** In the following question, two equations are given. You have to solve both the equations and mark the correct answer.
$2m^2 + 14m + 24 = 0$
$6n^2 + 36n + 48 = 0$
**1.** m < n
**2.** m ≤ n
**3.** m > n
**4.** m ≥ n
**5.** m = n or the relation between m and n can't be determined

**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.
$m^2 - 34m + 288 = 0$
$n^2 - 32n + 252 = 0$
**1.** m < n
**2.** m ≤ n
**3.** m > n
**4.** m ≥ n
**5.** m = n or the relation between m and n can't be determined

**Q:3** In the following question, two equations are given. You have to solve both the equations and mark the correct answer.
$m^2 + 7m + 12 = 0$
$n^2 + 10n + 24 = 0$
**1.** m < n
**2.** m ≤ n
**3.** m > n
**4.** m ≥ n
**5.** m = n or the relation between m and n can't be determined

**Q:4 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. $m^2 + 3m - 40 = 0$
II. $n^2 + 19n + 90 = 0$
**1.** m < n
**2.** m ≤ n
**3.** m > n
**4.** m ≥ n
**5.** m = n or the relation between m and n can't be determined

**Q:5 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. $2x^2 - 13x + 20 = 0$
II. $3y^2 + 14y - 5 = 0$
**1.** x < y
**2.** x ≤ y
**3.** x > y
**4.** x ≥ y
**5.** x = y or the relation between x and y can't be determined

**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. $x^2 - 28x + 195 = 0$
II. $2y^2 - 13y + 21 = 0$
**1.** x > y
**2.** x ≥ y
**3.** x < y
**4.** x ≤ 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. $7x^2/6 - 4x + 17/6 = 0$
II. $5y^2 - 37y/8 + 1/2 = 0$
**1.** x > y
**2.** x ≥ y
**3.** x < y
**4.** x ≤ 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. $21x^2 - 58x + 21 = 0$
II. $8y^2 - 14y + 3 = 0$
**1.** x > y
**2.** x ≥ y
**3.** x < y
**4.** x ≤ 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. $3x - 8\sqrt{x} + 5 = 0$

II. $3y - 11\sqrt{y} + 10 = 0$

**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. $2x^2 - 6.4x + 3.5 = 0$

II. $2y^2 - 4.8y + 2.7 = 0$

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

## Answers and Solutions

**Q:1** The correct answer is **Option 5** i.e. **m = n or the relation between m and n can't be determined.**

Equation 1

$2m^2 + 14m + 24 = 0$

$2m^2 + 6m + 8m + 24 = 0$

$(2m + 6)\, m + 4(2m + 6) = 0$

$(2m + 6)\,(m + 4) = 0$

$m = -3, -4$

Equation 2

$6n^2 + 36n + 48 = 0$

$n^2 + 2n + 4n + 8 = 0$

$(n + 2)\, n + 4(n + 2) = 0$

$(n + 4)\,(n + 2) = 0$

$n = -4, -2$

We can analyse,

| Value of m | Value of n | Result |
|---|---|---|
| -3 | -2 | m < n |
| -3 | -4 | m > n |
| -4 | -2 | m < n |
| -4 | -4 | m = n |

Hence, the relation between m and n can't be determined

**Q:2** The correct answer is **Option 5** i.e. **m = n or the relation between m and n can't be determined**

Equation 1

$m^2 - 34m + 288 = 0$

$m^2 - 18m - 16m + 288 = 0$

$(m - 18)m - 16(m - 18) = 0$

$(m - 16)(m - 18) = 0$

$m = 16, 18$

Equation 2

$n^2 - 32n + 252 = 0$

$n^2 - 18n - 14n + 252 = 0$

$(n - 18)n - 14(n - 18) = 0$

$(n - 14)(n - 18) = 0$

$n = 14, 18$

We can analyse,

| Value of m | Value of n | Result |
|---|---|---|
| 16 | 14 | m > n |
| 16 | 18 | m < n |
| 18 | 14 | m > n |
| 18 | 18 | m = n |

Hence, the relation between m and n can't be determined

**Q:3** The correct answer is **Option 4** i.e. **m ≥ n.**

Equation 1

$m^2 + 7m + 12 = 0$

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

$(m + 3)\, m + 4(m + 3) = 0$

$(m + 3)\,(m + 4) = 0$

$m = -3, -4$

Equation 2

$n^2 + 10n + 24 = 0$

$n^2 + 6n + 4n + 24 = 0$

$(n + 6)\, n + 4(n + 6) = 0$

$(n + 4)\,(n + 6) = 0$

$n = -4, -6$

We can analyse,

| Value of m | Value of n | Result |
|---|---|---|
| -3 | -4 | m > n |
| -3 | -6 | m > n |
| -4 | -4 | m = n |
| -4 | -6 | m > n |

Hence, m ≥ n

**Q:4** The correct answer is **Option 3** i.e. **m > n**

Equation 1

$m^2 + 3m - 40 = 0$

$m^2 + 8m - 5m - 40 = 0$

$(m + 8)\, m - 5(m + 8) = 0$



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$(m + 8)(m - 5) = 0$
$m = 5, -8$

Equation 2
$n^2 + 19n + 90 = 0$
$n^2 + 9n + 10n + 90 = 0$
$(n + 9)n + 10(n + 9) = 0$
$(n + 10)(n + 9) = 0$
$n = -9, -10$
We can analyse,

| Value of m | Value of n | Result |
|---|---|---|
| 5 | -9 | m > n |
| 5 | -10 | m > n |
| -8 | -9 | m > n |
| -8 | -10 | m > n |

Hence, m > n

**Q:5** The correct answer is **option 3** i.e. **x > y.**
$2x^2 - 13x + 20 = 0$
$\Rightarrow 2x^2 - 8x - 5x + 20 = 0$
$\Rightarrow 2x(x - 4) - 5(x - 4) = 0$
$\Rightarrow (x - 4)(2x - 5) = 0$
$\therefore x = 4, 5/2$
$3y^2 + 14y - 5 = 0$
$\Rightarrow 3y^2 + 15y - y - 5 = 0$
$\Rightarrow 3y(y + 5) - 1(y + 5) = 0$
$\Rightarrow (y + 5)(3y - 1) = 0$
$\therefore y = -5, 1/3$
We can analyse,

| Value of x | Value of y | Result |
|---|---|---|
| 4 | -5 | x > y |
| 4 | 1/3 | x > y |
| 5/2 | -5 | x > y |
| 5/2 | 1/3 | x > y |

Hence, x > y

**Q:6** The correct answer is **option 1** i.e. **x > y.**
Equation I
$x^2 - 28x + 195 = 0$
$x^2 - 13x - 15x + 195 = 0$
$(x - 13)(x - 15) = 0$
$x = 13, 15$
Equation II
$2y^2 - 13y + 21 = 0$
$2y^2 - 6y - 7y + 21 = 0$
$(y - 3)(2y - 7) = 0$
$y = 3, 7/2$
We can analyse,

| Value of x | Value of y | Result |
|---|---|---|
| 13 | 3 | x > y |
| 13 | 7/2 | x > y |
| 15 | 3 | x > y |
| 15 | 7/2 | x > y |

Hence, x > y

**Q:7** The correct answer is **option 1** i.e. **x > y**
Equation I
$7x^2/6 - 4x + 17/6 = 0$
$7x^2 - 24x + 17 = 0$
$(x - 1)(7x - 17) = 0$
$x = 17/7, 1$
Equation II
$5y^2 - 37y/8 + 1/2 = 0$
$40y^2 - 37y + 4 = 0$
$(8y - 1)(5y - 4) = 0$
$y = 1/8, 4/5$
We can analyse,

| Value of x | Value of y | Result |
|---|---|---|
| 17/7 | 1/8 | x > y |
| 17/7 | 4/5 | x > y |
| 1 | 1/8 | x > y |
| 1 | 4/5 | x > y |

Hence, **x > y**

**Q:8** The correct answer is **Option 5** i.e. **x = y or Relationship between x and y cannot be determined**
Equation I
$21x^2 - 58x + 21 = 0$
$(3x - 7)(7x - 3)$
$x = 3/7, 7/3$
Equation II
$8y^2 - 14y + 3 = 0$
$(2y - 3)(4y - 1) = 0$
$y = 3/2, 1/4$
We can analyse,

| Value of x | Value of y | Result |
|---|---|---|
| 3/7 | 3/2 | x < y |
| 3/7 | 1/4 | x > y |



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| | | |
|---|---|---|
| 7/3 | 3/2 | x > y |
| 7/3 | 1/4 | x > y |

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

**Q:9** The correct answer is **option 4** i.e. **x ≤ y**

Equation I

$3x - 8\sqrt{x} + 5 = 0$

$(\sqrt{x} - 1)(3\sqrt{x} - 5)$

$x = 1, 25/9$

Equation II

$3y - 11\sqrt{y} + 10 = 0$

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

$y = 25/9, 4$

We can analyse,

| Value of x | Value of y | Result |
|---|---|---|
| 1 | 25/9 | x < y |
| 1 | 4 | x < y |
| 25/9 | 25/9 | x = y |
| 25/9 | 4 | x < y |

Hence, **x ≤ y**

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

Equation I

$2x^2 - 6.4x + 3.5 = 0$

$(x - 0.7)(2x - 5)$

$x = 0.7, 5/2$

Equation II

$2y^2 - 4.8y + 2.7 = 0$

$(y - 0.9)(2y - 3) = 0$

$y = 0.9, 3/2$

We can analyse,

| Value of x | Value of y | Result |
|---|---|---|
| 0.7 | 0.9 | x < y |
| 0.7 | 3/2 | x < y |
| 5/2 | 0.9 | x > y |
| 5/2 | 3/2 | x > y |

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



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