

# **Quadratic Equation Questions for RRB Group-D PDF**

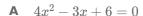
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#### Instructions

For the following questions answer them individually

#### Question 1

Which of the following quadratic equations has real roots?



**B** 
$$2x^2 + 7x + 6 = 0$$

**C** 
$$x^2 - 2x + 4 = 0$$

**D** 
$$3x^2 - 4x + 3 = 0$$

Answer: B

#### **Explanation:**

A quadratic equation :  $ax^2+bx+c=0$  has real roots iff Discriminant,  $\,D=b^2-4ac\geq 0\,$ 

(A): 
$$4x^2 - 3x + 6 = 0$$

$$=> D = (-3)^2 - 4(4)(6) = 9 - 96 = -87$$

(B): 
$$2x^2 + 7x + 6 = 0$$

$$=> D = (7)^2 - 4(2)(6) = 49 - 48 = 1$$

(C): 
$$x^2 - 2x + 4 = 0$$

$$\Rightarrow$$
 D =  $(-2)^2 - 4(1)(4) = 4 - 16 = -12$ 

(D): 
$$3x^2 - 4x + 3 = 0$$

$$=> D = (-4)^2 - 4(3)(3) = 16 - 36 = -20$$

Thus, the equation :  $2x^2 + 7x + 6 = 0$  has real roots.

#### **Question 2**

What is the value of m in the quadratic equation  $x^2+mx+24=0$  if one of its roots is  $\frac{3}{2}$ 



**c** 
$$-\frac{21}{2}$$

$$D = \frac{35}{2}$$

#### Answer: D

#### **Explanation:**

Putting  $x=rac{3}{2}$  in the quadratic equation :  $x^2+mx+24=0$ 

$$=> {3 \choose 2}^2 + m{3 \choose 2} + 24 = 0$$

$$=> {9\atop4}+24+{3m\atop2}=0$$

$$=> {3m \atop 2} = -{96+9 \choose 4}$$

$$=> m = { }^{-105} \times { }^{2} \times { }^{3}$$

$$=> m = { \begin{array}{c} -35 \\ 2 \end{array}}$$



#### **Question 3**

What are the roots of the quadratic equation:  $x^2+3x-154=0$ 

- **A** 21, 14
- **B** 11, -14
- **C** 14. -11
- **D** 14, 22

Answer: B

#### **Explanation:**

Equation : 
$$x^2 + 3x - 154 = 0$$

$$=> x^2 + 14x - 11x - 154 = 0$$

$$=> x(x+14) - 11(x+14) = 0$$

$$=>(x+14)(x-11)=0$$

$$=> x = -14, 11$$

=> Ans - (B)

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### Question 4

What are the roots of the quadratic equation  $21x^2 - 37x - 28 = 0$  ?

- **A**  $\begin{bmatrix} -7 & 4 \\ 3 & 7 \end{bmatrix}$
- **B**  $\begin{array}{ccc} 3 & -7 \\ 7 & 4 \end{array}$
- **c**  $\frac{7}{3}, \frac{-4}{7}$
- **D**  $\begin{array}{ccc} -3 & 7 \\ 7 & 4 \end{array}$

Answer: C

#### **Explanation:**

Equation : 
$$21x^2 - 37x - 28 = 0$$

$$=> 21x^2 - 49x + 12x - 28 = 0$$

$$=> 7x(3x-7)+4(3x-7)=0$$

$$=> (7x+4)(3x-7)=0$$

$$=> x = {7 \atop 7}, {7 \atop 3}$$

#### **Question 5**

Which of the following quadratic equations has real roots?

**A** 
$$4x^2 - 9x + 6 = 0$$

**B** 
$$3x^2 - 2x + 6 = 0$$

$$2x^2 - 7x + 6 = 0$$

#### **Explanation:**

A quadratic equation :  $ax^2+bx+c=0$  has real roots iff Discriminant,  $D=b^2-4ac\geq 0$ 

(A): 
$$4x^2 - 9x + 6 = 0$$

$$=> D = (-9)^2 - 4(4)(6) = 81 - 96 = -15$$

(B): 
$$3x^2 - 2x + 6 = 0$$

$$=> D = (-2)^2 - 4(3)(6) = 4 - 72 = -68$$

(C): 
$$2x^2 - 7x + 6 = 0$$

$$=> D = (-7)^2 - 4(2)(6) = 49 - 48 = 1$$

(D): 
$$x^2 - 2x + 2 = 0$$

$$=> D = (-2)^2 - 4(1)(2) = 4 - 8 = -4$$

Thus, the equation :  $2x^2 - 7x + 6 = 0$  has real roots.

#### **Question 6**

What are the roots of the quadratic equation  $4x^2 + 6x - 18 = 0$ ?

- **A** 3, -3
- **B** 3, 6
- **C** 3/2, -3
- **D** 3, 3

Answer: C

#### **Explanation:**

Expression :  $4x^2 + 6x - 18 = 0$ 

$$=> 4x^2 - 6x + 12x - 18 = 0$$

$$=> 2x(2x-3)+6(2x-3)=0$$

$$=> (2x+6)(2x-3)=0$$

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

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#### **Question 7**

Which of the following quadratic equations has real roots?

**A** 
$$3x^2 - 5x + 2 = 0$$

**B** 
$$3x^2 - 4x + 2 = 0$$

**C** 
$$4x^2 - 3x + 2 = 0$$

**D** 
$$5x^2 - 2x + 2 = 0$$

Answer: A

#### **Explanation:**

A quadratic equation :  $ax^2 + bx + c = 0$  has real roots iff Discriminant,  $D = b^2 - 4ac \ge 0$ 

(A): 
$$3x^2 - 5x + 2 = 0$$

$$=> D = (-5)^2 - 4(3)(2) = 25 - 24 = 1$$

(B): 
$$3x^2 - 4x + 2 = 0$$

$$=> D = (-4)^2 - 4(3)(2) = 16 - 24 = -8$$

(C): 
$$4x^2 - 3x + 2 = 0$$

$$=> D = (-3)^2 - 4(4)(2) = 9 - 32 = -23$$

(D): 
$$5x^2 - 2x + 2 = 0$$

$$=> D = (-2)^2 - 4(5)(2) = 4 - 40 = -36$$

Thus, the equation :  $3x^2 - 5x + 2 = 0$  has real roots.

#### **Question 8**

Find the roots of the quadratic equation :  $27x^2 + 57x - 14 = 0$ 

**Answer:** B

#### **Explanation:**

Expression : 
$$27x^2 + 57x - 14 = 0$$

$$=>27x^2-6x+63x-14=0$$

$$=> 3x(9x-2) + 7(9x-2) = 0$$

$$=> (3x+7)(9x-2)=0$$

$$=> x = \frac{2}{9}, \frac{7}{3}$$

#### Question 9

### Which of the following is not a quadratic equation?

**A** 
$$3x(x+5)-11=2x(x-2)+6$$

**B** 
$$4x(x+3) + 7 = 4x(x-11) + 9$$

$$x(x+2) - 15 = x(2x-5) + 11$$

**D** 
$$4x^2 - 6x - 9 = 0$$

#### Answer: B

#### **Explanation:**

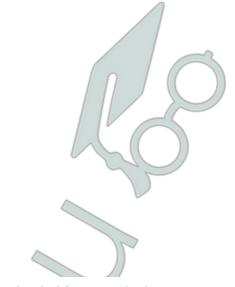
(A): 
$$3x(x+5) - 11 = 2x(x-2) + 6$$

$$=> 3x^2 + 15x - 11 = 2x^2 - 4x + 6$$

$$=> x^2 + 19x - 17 = 0$$

(B): 
$$4x(x+3) + 7 = 4x(x-11) + 9$$

$$=> 4x^2 + 12x + 7 = 4x^2 - 44x + 9$$



$$=>56x-2=0$$

(C): 
$$x(x+2) - 15 = x(2x-5) + 11$$

$$=> x^2 + 2x - 15 = 2x^2 - 5x + 11$$

$$=> x^2 - 7x + 26 = 0$$

(D): 
$$4x^2 - 6x - 9 = 0$$

... Option (B) is not a quadratic equation.

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**Question 10** 

Find the difference of the roots of the equation  $x^2-8x+13=0$ 

- **A** 2
- **B** 4
- **c**  $2\sqrt{3}$
- D  $4\sqrt{3}$

Answer:

### **Explanation:**

let a and b be the roots.

$$a+b = 8$$

$$ab = 13$$

$$a-b = \sqrt{(a+b)^2 - 4ab}$$

$$=\sqrt{8^2-4*13}$$

$$=\sqrt{12}$$

$$=2\sqrt{3}$$

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