## QUADRATIC EQUATION

## EXERCISE

## NATURE OF CHARACTERSTICS OF ROOTS OF EQUATION

Q1. Find the value of k for which quadratic equation  $(k - 2)x^2 + 2(2k - 3)x + 5k - 6 = 0$  has equal roots.

0

Q2. Find the discriminant of the following quadratic equations :

(i) $x^2 - 3x + 1 = 0$	(ii) $4x^2 + 3x - 2 = 0$
(iii) $x^2 - x + 1 = 0$	(iv) $9x^2 - px + 2 = 0$
(v) $ax^2 - 3x - 5 = 0$	(vi) $4x^2 - 5x + c = 0$
(vii) $\sqrt{2}x^2 + 5\sqrt{3}x - 2\sqrt{2} = 0$	(viii) $3\sqrt{5}x^2 - 8x + 2\sqrt{5} =$

Q3. Find the sum and the product of the roots of the following equations :

(i)  $2x^2 - 7x + 4 = 0$ (ii)  $3x^2 + 4\sqrt{2}x + 9 = 0$ (iii)  $2x^2 + 5\sqrt{3}x - 3 = 0$ (iv)  $x^2 - 2\sqrt{5}x - 15 = 0$ (v)  $5x^2 - 10x + 3\sqrt{5} = 0$ 

Q4. In the following, determine the set of values of p for which the quadratic equation has real roots :

(i) 
$$px^2 + 4x + 1 = 0$$
  
(ii)  $2x^2 + 3x + p = 0$   
(iii)  $2x^2 + px + 3 = 0$   
(iv)  $3x^2 - 2px - 5 = 0$   
(v)  $2px^2 - 6x - 3 = 0$ 

Q5. In the following, determine whether the given quadratic equations have real roots and

If so find the roots :

(i) $x^2 + 6x + 6 = 0$	(ii) $x^2 - 3x + 4 = 0$
(iii) $4x^2 + x - 3 = 0$	(iv) $9x^2 + 30x + 25 = 0$
$(v) 4x^2 - 12x + 9 = 0$	(vi) $3x^2 - 3x + 1 = 0$
(vii) $3x^2 - 3x - 1 = 0$	(viii) $4x^2 + 5\sqrt{3}x + 3 = 0$
(ix) $5x^2 - 2\sqrt{5}x - 3 = 0$	

- Q6. Find the quadratic equation whose roots are :
  - (i) 5 and -5(ii) 8 and 3(iii) -8 and -3(iv) -8 and 3(v)  $\sqrt{3} \text{ and } 5\sqrt{3}$ (vi)  $2\sqrt{2} \text{ and } -3\sqrt{2}$ (vii)  $-3\sqrt{5} \text{ and } -4\sqrt{5}$ (viii)  $1 + \sqrt{2} \text{ and } 1 - \sqrt{2}$ (ix)  $4 - \sqrt{5} \text{ and } 4 + \sqrt{5}$ (x)  $7 + \sqrt{7} \text{ and } 7 - \sqrt{7}$ (xi)  $\frac{3+\sqrt{2}}{3} \text{ and } \frac{3-\sqrt{2}}{3}$ (xii)  $\frac{4-\sqrt{5}}{2} \text{ and } \frac{4+\sqrt{5}}{2}$
- Q7. Solve using discriminant method :  $9x^2 12x + 4 = 0$ .
- Q8. In the following determine the set of values of 'p' for which the given equation has real Roots (i)  $px^2 + 4x + 1 = 0$  (ii)  $2x^2 + px + 3 = 0$
- Q9. If one of the roots of the quadratic equation  $2x^2 + px + 4 = 0$  is 2, find the value of p. also find the value of the other roots.
- Q10. In the following, find the value (s) of p so that the given equation has equal roots.

(i) 
$$3x^2 - 5x + p = 0$$
 (ii)  $2px^2 - 8x + p = 0$ 

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## ANSWER

1.	k = 3 or 1					
2.	(i) 5	(ii) 41	(iii) – 3	(iv) p <sup>2</sup>	- 72	
	(v) 9 + 20a	(vi) 25 – 16c	(vii) 91	(viii) -56		
3.	(i) $\frac{7}{2}$ , 2 (i)	i) $\frac{-4\sqrt{2}}{3}$ , 3	(iii) $\frac{-5\sqrt{3}}{2}$ , $-\frac{3}{2}$	(iv) 2√5,	-15 (v)	2, $\frac{3\sqrt{5}}{5}$
4.	(i) p ≤ 4 (ii	$p \le \frac{9}{8}$ (4)	iii) $p^2 \ge 24$	(iv) p <sup>2</sup> + 1	$15 \ge 0$ (v) p	$\geq -\frac{3}{2}$
5.	(i) yes, – 3 ±	$\sqrt{3}$ (ii) no	(iii) yes, -1, -	$\frac{3}{4}$	(iv) yes, $-\frac{5}{3}$ ,	$-\frac{5}{3}$
	(v) yes, $\frac{3}{2}$ , $\frac{3}{2}$	(vi) no	(vii) yes, $\frac{3\pm 2}{6}$	$\frac{\sqrt{21}}{5}$	(viii) yes, – √	$\sqrt{3}, -\frac{\sqrt{3}}{4}$
	(ix) yes, $\frac{3}{2}$	$\frac{\sqrt{5}}{5}$				
6.	(i) $x^2 - 25 =$	0 (	ii) $x^2 - 11x + 24 =$	0	(iii) $x^2 + 11x$	x + 24 = 0
	(iv) $x^2 + 5x -$	-24 = 0 (*	v) $x^2 - 6\sqrt{3}x + 15 =$	= 0	(vi) $x^2 + \sqrt{2}$	x - 12 = 0
	(vii) $x^2 + 7\sqrt{2}$	$\overline{5}x + 60 = 0  (7)$	viii) $x^2 - 2x - 1 = 0$		(ix) x <sup>2</sup> - 8x -	11 = 0
	(x) x <sup>2</sup> - 14x -	+42 = 0 (2)	xi) $9x^2 - 18x + 7 =$	0	(xii) 4x <sup>2</sup> - 16	5x + 11 = 0
7.	$x=\frac{2}{3}$					
8.	(i) p ≤ 4	(ii) $p \le -2\sqrt{6}$				
9.	p = -6, other	r root is 1.				

10. (i) 
$$p = \frac{25}{12}$$
 (ii)  $p = \pm 2\sqrt{2}$ 

3