

CHAPTER 4: QUADRATIC EQUATIONS

1	Which one of the following is not a quadratic equation?			
	(a) $(x + 2)^2 = 2(x + 3)$		(b) $x^2 + 3x = (-1)(1 - 3x)^2$	
	(c) $(x + 2)(x - 1) = x^2 - 2x - 3$		(d) $x^3 - x^2 + 2x + 1 = (x + 1)^3$	
2	Which of the following equations has 2 as a root?			
	(a) $x^2 - 4x + 5 = 0$		(b) $x^2 + 3x - 12 = 0$	
	(c) $2x^2 - 7x + 6 = 0$		(d) $3x^2 - 6x - 2 = 0$	
3	If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is			
	(a) 2	(b) -2	(c) $\frac{1}{4}$	(d) $\frac{1}{2}$
4	Which of the following equations has the sum of its roots as 3?			
	(a) $2x^2 - 3x + 6 = 0$		(b) $-x^2 + 3x - 3 = 0$	
	(c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$		(d) $3x^2 - 3x + 3 = 0$	
5	Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is			
	(a) 0 Only	(b) 4 Only	(c) 8 Only	(d) 0 and 8
6	The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has			
	(a) two distinct real roots		(b) two equal real roots	
	(c) no real roots		(d) more than 2 real roots	
7	Which of the following equations has two distinct real roots?			
	(a) $2x^2 - 3\sqrt{2}x + \frac{9}{4} = 0$		(b) $x^2 + x - 5 = 0$	
	(c) $x^2 + 3x + 2\sqrt{2} = 0$		(d) $5x^2 - 3x + 1 = 0$	
8	Which of the following equations has no real roots?			
	(a) $x^2 - 4x + 3\sqrt{2} = 0$		(b) $x^2 + 4x - 3\sqrt{2} = 0$	
	(c) $x^2 - 4x - 3\sqrt{2} = 0$		(d) $3x^2 + 4\sqrt{3}x + 4 = 0$	

9	The discriminant of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$ is			
	(a) 8	(b) 64	(c) $\frac{-1}{3\sqrt{3}}$	(d) $-\sqrt{3}$
10	A sum of ₹4000 was divided among x persons. Had there been 10 more persons, each would have got ₹80 less. Which of the following represents the above situation?			
	(a) $x^2 + 10x - 500 = 0$		(b) $8x^2 + 10x - 400 = 0$	
	(c) $x^2 + 10x + 500 = 0$		(d) $8x^2 + 10x + 400 = 0$	
11	The product of two consecutive integers is equal to 6 times the sum of the two integers. If the smaller integer is x, which of the following equations represent the above situation?			
	(a) $x^2 + 11x + 6 = 0$		(b) $x^2 - 11x - 6 = 0$	
	(c) $x^2 + 11x - 6 = 0$		(d) $x^2 - 11x + 6 = 0$	
12	Consider the equation $kx^2 + 2x = c(2x^2 + b)$ For the equation to be quadratic, which of these cannot be the value of k?			
	(a) c	(b) 2c	(c) 3c	(d) $2c + 2b$
13	What is the smallest positive integer value of k such that the roots of the equation $x^2 - 9x + 18 + k = 0$ can be calculated by factoring the equation?			
	(a) 1	(b) 2	(c) 3	(d) 4
14	Rahul follows the below steps to find the roots of the equation $3x^2 - 11x - 20 = 0$, by splitting the middle term. Step 1: $3x^2 - 11x - 20 = 0$ Step 2: $3x^2 - 15x + 4x - 20 = 0$ Step 3: $3x(x - 5) + 4(x - 5) = 0$ Step 4: $(3x - 4)(x - 5) = 0$ Step 5: $x = \frac{4}{3}$ and 5 In which step did Rahul make the first error?			
	(a) Step 2	(b) Step 3	(c) Step 4	(d) Step 5
15	The roots of $ax^2 + bx + c = 0$, $a \neq 0$ are real and unequal. Which of these is true about the value of discriminant, D?			
	(a) $D < 0$	(b) $D > 0$	(c) $D = 0$	(d) $D \leq 0$

16	Consider the equation $px^2 + qx + r = 0$. Which conditions are sufficient to conclude that the equation have real roots?			
	(a) $p > 0, r < 0$	(b) $p > 0, r > 0$	(c) $p > 0, q > 0$	(d) $p > 0, q < 0$
17	For what value of k, the quadratic equation $3x^2 + 2kx + 27 = 0$ has equal real roots?			
	(a) $k = \pm 3$	(b) $k = \pm 9$	(c) $k = \pm 6$	(d) $k = \pm 4$
18	If the equation $x^2 - mx + 1 = 0$ does not possess real roots, then			
	(a) $-3 < m < 3$	(b) $-2 < m < 2$	(c) $m > 2$	(d) $m < -2$
19	If α and β are the roots of $x^2 + 7x + 10 = 0$, find the value of $\alpha^2 + \beta^2$			
	(a) 29	(b) 69	(c) 49	(d) 20
20	If α, β are the roots of the equation $2x^2 - x - 1 = 0$, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.			
	(a) 1	(b) -1	(c) $\frac{1}{2}$	(d) $\frac{-1}{2}$
21	If one root of the equation $2y^2 - ay + 64 = 0$ is twice the other, then find the values of a .			
	(a) $a = \pm 8$	(b) $a = \pm 16$	(c) $a = \pm 24$	(d) $a = \pm 4$
22	If one root of the equation $3x^2 + kx + 81 = 0$ (having real roots) is the square of the other, then value of k			
	(a) $k = 27$	(b) $k = -27$	(c) $k = 36$	(d) $k = -36$
23	A quadratic equation, the sum of whose roots is 0 and one root is 4, is			
	(a) $x^2 - 16$	(b) $x^2 + 16$	(c) $x^2 + 4$	(d) $x^2 - 4$
24	If the quadratic equation $x^2 - 8x + k = 0$ has real roots, then			
	(a) $k < 16$	(b) $k \leq 16$	(c) $k > 16$	(d) $k \geq 16$
25	If $x = 3$ is one of the roots of the quadratic equation $x^2 - 2kx - 6 = 0$, then the value of k is			
	(a) $\frac{-1}{2}$	(b) $\frac{1}{2}$	(c) 3	(d) 2

	Assertion-Reason Questions
	DIRECTION: In the question number 26 and 30, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.
26	Assertion(A): If one root of the quadratic equation $6x^2 - x - k = 0$ is $\frac{2}{3}$, then the value of k is 2. Reason(R): The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has almost two roots.
27	Assertion(A): The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are real Reason(R): If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are not real.
28	Assertion: $(2x - 1)^2 - 4x^2 + 5 = 0$ is not a quadratic equation. Reason: An equation of the form $ax^2 + bx + c = 0$, ($a \neq 0$, where a, b and c are real numbers) is called a quadratic equation.
29	Assertion: $3x^2 - 6x + 3 = 0$ has equal real roots. Reason: The quadratic equation $ax^2 + bx + c = 0$ have equal real roots if discriminant $D > 0$.
30	Assertion(A): The equation $9x^2 + 3kx + 4 = 0$ has equal roots for $k = 9$. Reason (R): If discriminant 'D' of a quadratic equation is equal to zero, then roots of equation are real and equal.

	ANSWERS		
1	(c) $(x + 2)(x - 1) = x^2 - 2x - 3$	16	(a) $p > 0, r < 0$
2	(c) $2x^2 - 7x + 6 = 0$	17	(b) $k = \pm 9$
3	(a) 2	18	(b) $-2 < m < 2$
4	(b) $-x^2 + 3x - 3 = 0$	19	(a) 29
5	(c) 8 Only	20	(b) -1
6	(c) no real roots	21	(c) $a = \pm 24$
7	(b) $x^2 + x - 5 = 0$	22	(d) $k = -36$
8	(a) $x^2 - 4x + 3\sqrt{2} = 0$	23	(a) $x^2 - 16$
9	(b) 64	24	(b) $k \leq 16$
10	(a) $x^2 + 10x - 500 = 0$	25	(b) $\frac{1}{2}$
11	(b) $x^2 - 11x - 6 = 0$	26	(b)
12	(b) 2c	27	(d)
13	(b) 2	28	(a)
14	(c) Step 4	29	(c)
15	(b) $D > 0$	30	(d)