INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

4. Quadratic Equations

Name: _____ Date:_____ Class: X Sec:___

1.	If one root of the quadratic equation $6x^2 - x - k = 0$ $is\frac{2}{3}$, then find the value of k. a)1 b) 2 c) 3 d) 4
2.	If the quadratic equation $px^2 - 2\sqrt{5}px + 15 = 0$ has two equal roots, then find the value of p. a) 0 b) 3 c) 0 and 3 d) none of these
3.	If 1 is a root of the equation $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0, then\ ab$ equals: a)3 b) $-\frac{7}{2}$ c)6 d)-3
4.	If the quadratic equation $mx^2 + 2x + m = 0$ has two equal roots, then the values of m are: a) ± 1 b) 0,2 c) 0,1 d) $-1,0$
5.	The roots of the equation $x^2 + x \pm p(p+1) = 0$, where p is a constant, are a) $p, p+1$ b) $-p, p+1$ c) $p, -(p+1)$ d) $-p, -(p+1)$
6.	Write the nature of roots of the quadratic equation i) $4x^2 + 4\sqrt{3}x + 3 = 0.$ ii) $4x^2 - 12x - 9 = 0$
7.	Find the value of k , if the quadratic equation $x^2 - kx + 4 = 0$ has equal roots?
8.	Find the consecutive natural numbers, the sum of whose squares is 145.
9.	Assertion A: $(2x-1)^2 - 4x^2 + 5 = 0$ is not a quadratic equation. Reason R: An equation of the form $ax^2 + bx + c = 0, a \neq 0$, where a,b,c are real numbers is called quadratic equation.
10.	Assertion: The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are not real. **Reason:** If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are not real.
11.	**Assertion:** $3x^2 - 6x + 3 = 0$ has repeated roots. **Reason:** The quadratic equation $ax^2 + bx + c = 0$ have repeated roots if discriminant $D > 0$.
12.	In a flight of 2800km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100km/hr and time increased by 30 minutes. Find the original duration of the flight.
13.	Find the roots of the equation $\frac{1}{x+1} + \frac{2}{x+2} = \frac{5}{x+4}$.
14.	Solve for x: $\sqrt{3}x^2 + 10x - 8\sqrt{3} = 0$.
15.	If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.
16.	If $x = \frac{2}{3}$ and $x = -3$ are roots of the quadratic equation $ax^2 + 7x + b = 0$, find the values of a and b.
17.	If 2 is a root of the equation $x^2 + kx + 12 = 0$ and the equation $x^2 + kx + q = 0$ has equal roots, find the value of q.

18.	Solve for x: $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$
19.	The sum of two natural numbers is 8 and their product is 15, find the numbers.
20.	The student had walked 1km/hr faster, he would have taken 15 minutes less to walk 3km. Find the rate at which he is walking.
21.	A train travels at a certain average speed for a distance of 63km and then travels at a distance of72 km at an average speed of 6km/hr more than its original speed. If it takes 3 hours to complete total journey , what is the original average speed?
22.	Three consecutive natural numbers are such that the square of the middle number exceeds the difference of the squares of the other two by 60. Find the numbers.
23.	The hypotenuse (in cm) of a right angled triangle is 6 cm more than twice the length of the shortest side. If the length of third side is 6 cm less than thrice the length of shortest side, then find the dimensions of the triangle.
24.	**Case Study:**In the picture given below, one can see a rectangular in-ground swimming pool installed by a family in their backyard. There is a concrete sidewalk around the pool of width x m. The outside edges of the sidewalk measure 7 m and 12 m. The area of the pool is 36 sq. m.  Based on the information given above, i) form a quadratic equation in terms of x. ii) Find the width of the sidewalk around the pool.
25.	**Case Study:**Due to some technical problem, plane got delayed by half an hour. To reach the destination 1500km away in time, the speed of the plane was increased by 250km/hr than the usual speed. i) If x represents the usual speed of the plane, form the quadratic equation for the above situation. ii) What is the usual speed of the plane? iii) Find the increased speed of the plane.
26.	**Case study:** Some students arranged a picnic. The budget for food was ₹240. Due to certain reasons four students of the group failed to go, the cost of food to each student got increased by ₹5. Based on the above information , answer the following: i) Form the quadratic equation for the above situation. ii) Find the discriminant of the above equation. iii) How many students went for picnic?