

INTERNATIONAL INDIAN SCHOOL BURAIDAH

Worksheet for the Academic Year 2023-24

CLASS: X SUBJECT: MATHEMATICS DATE: 18-06-2023

LESSON:4 – QUADRATIC EQUATIONS

Level1

1. If $x = 3$ is one root of the quadratic equation $x^2 - 2kx - 6 = 0$, then find the value of k (Ans: $k = \frac{1}{2}$)
2. Write the discriminant of the quadratic equations:
 - a) $(x+5)^2 = 2(5x-3)$ (Ans: -124)
 - b) $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$ (Ans: 32)
3. Find the value of k for which the quadratic equation $9x^2 + 6kx + 4 = 0$ has equal roots (Ans: ± 2)
4. For what values of k , the roots of the equation $x^2 + 4x + k = 0$ are real? (Ans: $k \leq 4$)
5. Find the nature of roots of the quadratic equation $2x^2 - 4x + 3 = 0$ (Ans: no real roots)
6. Solve the quadratic equation by factorization:
 - a) $9x^2 - 3x - 2 = 0$ (Ans: $\frac{2}{3}, \frac{-1}{3}$)
 - b) $25x(x+1) = -4$ (Ans: $\frac{4}{5}, \frac{-1}{5}$)
 - c) $\frac{1}{x-3} + \frac{2}{x-2} = \frac{8}{x}$ $x \neq 0, 2, 3$ (Ans: $4, \frac{12}{5}$)
7. Using quadratic formula, solve the quadratic equations:
 - a) $16x^2 = 24x + 1$ (Ans: $\frac{3 \pm \sqrt{10}}{4}$)
 - b) $\frac{16}{x} - 1 = \frac{15}{x+1}, x \neq 0, -1$ (Ans: ± 4)
8. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, find the numbers. (Ans: 10 & 5)
9. The sum of the squares of two consecutive multiples of 7 is 637. Find the multiples. (Ans: 14, 21)

Level 2 :

10. The denominator of a fraction is one more than twice its numerator. If the sum of the fraction and its reciprocal is $2\frac{16}{21}$, Find the fraction.

(Ans: $\frac{3}{7}$)

11. The sum of two numbers is 34. If 3 is subtracted from one number and 2 is added to another, the product of these two numbers becomes 260. Find the numbers.

(Ans: 23,11 OR 16,18)

12. The hypotenuse of a right-angled triangle is 6cm more than twice the length of the shortest side. If the length of the third side is 6cm less than thrice the length of shortest side, then find the dimensions of the triangle.

(Ans: 10,24 & 26)

13. A train travels 180km at a uniform speed. If the speed had been 9km/hour more, it would have taken 1 hour less for same journey. Find the speed of the train

(Ans: 36km/hr)

14. Had Aarush scored 8 more marks in a Mathematics test, out of 35 marks, 7 times these marks would have been 4 less than square of his actual marks. How many marks did he get in the test?

(Ans: 12 marks)

15. If the root of the quadratic equation $(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0$ are equal, prove that $ad = bc$
