

DAV PUBLIC SCHOOL, IFFCO, PARADEEP

CLASS-X

SUB-MATHEMATICS

TOPIC-QUADRATIC EQUATION

WORKSHEET-ADVANCED

Choose the most appropriate option (1 mark each)

1. Sum of squares of two consecutive natural number is 313. The numbers are

- (A) 12,13 (B) 13, 14 (C) 11,12 (D) 14,15

2. If $x^2 + 5px + 16 = 0$ has no real root, then

- (A) $p > \frac{8}{5}$ (B) $p < \frac{-8}{5}$ (C) $\frac{-8}{5} < p < \frac{8}{5}$ (D) none of these

Fill in the blanks: (1 mark each)

3. If $x = -1$ is a common root of $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then $ab = \underline{\hspace{2cm}}$.

4. The value of k , for which the roots of $x^2 - kx + 1 = 0$ are imaginary is $\underline{\hspace{2cm}}$.

Answer the following question: (1 mark each)

5. If $(1 - p)$ is one root of the quadratic equation $x^2 + px + 1 - p = 0$, then find the value of 'p', hence find the roots of the given quadratic equation.

6. For what value of k , the given equation $(4 - k)x^2 + (2k + 4)x + (8k + 1) = 0$ is a perfect square.

Short Answer Type Question –I (2 marks each)

7. Solve : $5^{x+1} + 5^{2-x} = 5^3 + 1$

8. If -4 is a root of the equation $x^2 + px - 4 = 0$ and the equation $x^2 + px + q = 0$ has equal roots, find the values of p and q .

9. Does there exist a quadratic equation whose coefficients are all distinct irrationals but both the roots are rationals? Why?

Short Answer Type Question –II (3 marks each)

10. Solve for x : $(p^2 - q^2)x^2 - (q^2 - r^2)x + r^2 - p^2 = 0$

11. If the roots of the quadratic equation $(a - b)x^2 + (b - c)x + (c - a) = 0$ are equal, prove that $2a = b + c$.

12. solve for x: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$ [$a \neq 0, b \neq 0, x \neq 0, x \neq -(a+b)$]

Long answer type question:

(4 marks each)

13. A rectangular field is 20m long and 14m wide. There is a path of equal width all around it, having an area of 111 sq m. Find the width of the path.

14. A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train.

15. If Zeba were younger by 5 years than what she really is, then the square of her age (in years) would have been 11 more than five times her actual age. What is her age now?