Mathematics

(Chapter – 4) (Quadratic Equations) (Practice Test 3)

Class X

Time: 2 Hours   M. M: 50

General Instructions:

1. This question paper contains four sections: A, B, C and D. Each part is compulsory.
2. Section A has 10 MCQ of one mark each.
3. Section B has 5 questions of two marks each.
4. Section C has 6 questions of three marks each. attempt any 5 out of 6.
5. Section D has 5 questions of five marks each, attempt any 3 out of 5.
6. There is no negative marking.

[Section – A]

1. Which of the following is a quadratic equation?
   (A) $x^2 + 3x – 5 = 0$ (B) $x^2 + x^3 + 2 = 0$ (C) $3 + x + x^2 = 0$ (D) $x^2 – 9 = 0$

2. The quadratic equation has degree
   (A) 0   (B) 1   (C) 2   (D) 3

3. The cubic equation has degree
   (A) 1   (B) 2   (C) 3   (D) 4

4. A bi-quadratic equation has degree
   (A) 1   (B) 2   (C) 3   (D) 4

5. The polynomial equation $x(x + 1) + 8 = (x + 2)(x – 2)$ is
   (A) linear equation   (B) quadratic equation   (C) cubic equation   (D) bi-quadratic equation

6. The equation $(x – 2)^2 + 1 = 2x – 3$ is a
   (A) 5   (B) 6   (C) 7   (D) none of these

7. The roots of the quadratic equation $6x^2 – x – 2 = 0$ are
   (A) $\frac{2}{3}, \frac{1}{2}$ (B) $-\frac{2}{3}, \frac{1}{2}$ (C) $\frac{2}{3}, -\frac{1}{2}$ (D) $-\frac{2}{3}, -\frac{1}{2}$

8. The quadratic equation whose roots are 1 and -1
   (A) $2x^2 + x – 1 = 0$ (B) $2x^2 – x – 1 = 0$ (C) $2x^2 + x + 1 = 0$ (D) $2x^2 – x + 1 = 0$

9. The quadratic equation whose one rational root is $3 + \sqrt{2}$ is
   (A) $x^2 – 7x + 5 = 0$ (B) $x^2 + 7x + 6 = 0$ (C) $x^2 – 7x + 6 = 0$ (D) $x^2 – 6x + 7 = 0$

10. The equation $2x^2 + kx + 3 = 0$ has two equal roots, then the value of k is
    (A) $\pm\sqrt{6}$ (B) ± 4 (C) $\pm 3\sqrt{2}$ (D) $\pm 2\sqrt{6}$

[Section – B]

11. Solve the following problems given:
    (A) $x^2 – 45x + 324 = 0$
    (B) $x^2 – 55x + 750 = 0$

12. Find two numbers whose sum is 27 and product is 182.

13. Find two consecutive positive integers, sum of whose squares is 365.

14. The altitude of right triangle is 7 cm less than its base. If, hypotenuse is 13 cm. Find the other two sides.

15. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If, the total cost of production on that day was Rs.90, find the number of articles produced and the cost of each article.

[Section – C]

16. In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

17. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

18. Is it possible to design a rectangular mango grove whose length is twice its breadth, and the area is 800 m². If so, find its length and breadth.

19. Is the following situation possible? If so, determine their present ages.
    The sum of the ages of two friends is 20 years. Four years ago, the product of their ages in years was 48.

20. A train travels 360 km at a uniform speed. If, the speed had been 5 km/hr more, it would have taken 1 hour less for the same journey. Find the speed of the train.

21. The diagonal of a rectangular field is 60 metres more than the shorter side. If, the longer side is 30 metres more than the shorter side, find the sides of the field.

[Section – D]

22. Solve for x by quadratic formula $p^2x^2 + (p^2 – q^2) x – q^2 = 0$

23. Solve the equation $\dfrac{14}{x+3} - 1 = \dfrac{5}{x+1}; x \neq -3, -1$ for x.

24. 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.

25. If the sum of two natural numbers is 8 and their product is 15, find the numbers.

26. Find the values of k for which the quadratic equation $(3k + 1) x^2 + 2(k + 1) x + 1 = 0$ has equal roots. Also find the roots.

Mathematics

Answers

Section – A

1. $x^2 + x3 + 2 = 0$
2. 2
3. 3
4. 4
5. linear equation
6. quadratic equation
7. $\dfrac{2}{3}, -\dfrac{1}{2}$
8. $2x^2 - x - 1 = 0$
9. $x^2 - 6x + 7 = 0$
10. $\pm 2\sqrt{6}$

Section – B

11.
   (A) x = 9, 36
   (B) x = 30, 25
12. Two numbers are 13 and 14.
13. Two consecutive positive integers are 13 and 14 whose sum of squares is equal to 365.
14. 5 cm
15. 6

Section – C

16. Her marks in Mathematics and English are (13, 17) or (12, 18).
17. two numbers are (12,18) or (−12,18)
18. 40 m
19. The give situation is not possible.
20. 40 km/hr
21. Length of sides are 90 and 120 in metres.

Section – D

22. $x = \dfrac{q^2}{p^2}$ or x = -1
23. x = 1 or x = 4
24. Numbers are 9, 10, and 11.
25. When x = 3, numbers are 3 and 5.
    When x = 5, numbers are 5 and 3.
26. Equal roots, $-\dfrac{1}{2}$