CBSE

QUADRATIC EQUATIONS WS 6

Class 10 - Mathematics

Section A

1. Priya can row her boat at a speed of 5 km/hr in still water. If it takes her 1 hour more to row the boat 5.25 km **[1]** upstream than to return downstream, find the speed of the stream.

   a) 4 km/hr
   b) 3 km/hr

   c) 2 km/hr
   d) 5 km/hr

2. ₹ 6500 were divided equally among a certain number of persons. If there had been 15 more persons, each would **[1]** have got ₹30 less. Find the original number of persons.

   a) 60
   b) 45

   c) 55
   d) 50

3. The angry Arjun carried some arrows for fighting with Bheeshma. With half the arrows, he cut down the arrows **[1]** thrown by Bheeshma on him and with six other arrows he killed the rath driver of Bheeshma. With one arrow each, he knocked down respectively the rath, flag and bow of Bheeshma. Finally, with one more than four times the square root of arrows, he laid Bheeshma unconscious on an arrow bed. The total number of arrows that Arjun had, is

   a) 100
   b) 96

   c) 80
   d) 120

4. In a bangle shop, if the shopkeeper displays the bangles in the form of a square then he is left with 38 bangles. If **[1]** he wanted to increase the size of square by one unit each side of the square he found that 25 bangles fall short of in completing the square. The actual number of bangles which he had with him in the shop was _____.

   a) 538
   b) 1690

   c) 999
   d) Can't be determined

5. Rohan's mother is 26 years older than him. The product of their ages 3 years from now will be 360, then **[1]** Rohan's present age is

   a) 6 years
   b) 7 years

   c) 10 years
   d) 8 years

6. A takes 10 days less than the time taken by B to finish a piece of work. If both A and B together can finish the **[1]** work in 12 days, then the time taken by B to finish the work is

   a) 28 days
   b) 20 days

   c) 30 days
   d) 25 days

7. By a reduction of Re.1 per kg in the price of sugar, Radha can buy one kg sugar more for Rs.56. The original **[1]** price of 1 kg of sugar is

a) Rs.8   b) Rs.7

c) Rs.9   d) Rs.6

8. 500 bananas were divided equally among a certain number of students. If there were 25 more students, each would have received one banana less. Then the number of students is **[1]**

     a) 500   b) 125

     c) 250   d) 100

9. The sum of reciprocals of Sharma's age 3 years ago and 5 years from now is $\frac{1}{3}$, then his present age is **[1]**

     a) 7 years   b) 10 years

     c) 6 years   d) 8 years

10. A train travels 360km at a uniform speed. If the speed had been 5 km/hr more, it would have taken 1 hour less for the same journey, then the actual speed of the train is **[1]**

     a) 48 km/hr   b) 36 km /hr

     c) 40 km/hr   d) 45 km/hr

11. If I had walked 1 km per hour faster, I would have taken 10 minutes less to walk 2 km. Then the rate of my walking is **[1]**

     a) 8 km/hr   b) 6 km /hr

     c) 3 km/hr   d) 4 km/hr

12. A cyclist takes 2 hours less to cover a distance of 200 km, if he increases his speed by 5 km/hr. Then his original speed is **[1]**

     a) 26 km/hr   b) 20 km/hr

     c) 24 km/hr   d) 25 km/hr

13. John and Jivanti together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124. We would like to find out how many marbles they had to start with. Represent the situation mathematically (quadratic equation). **[1]**

Section B

Question No. 14 to 15 are based on the given text. Read the text carefully and answer the questions: **[2]**

Social work aims at fulfilment of human needs. Social workers aim to open the doors of access and opportunity for those who are in greatest need. Free education is a great social work. By doing so, we can remove illiteracy from our society.

Rohan, being a social worker, wants to donate his land to the Village Panchayat for opening of a school.

Rohan's land is in the form of a rectangel of dimension 500 m × 400 m. The Village Panchayat decides to leave the area on all the four sides of the land for grass and flowers. If width of x m land is kept for grass and flowers on all the four sides (as shown in Figure);

14. Find the lengths PQ and QR if area of grass and flowers region surrounding PQRS is 118400 m^2.

15. Also, find the perimeter of the rectangle PQRS.

16. The sum of the reciprocals of Rehman's ages (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age (in years). **[2]**

17. Ram takes 6 days less than Bhagat to finish a piece of work. If both of them together can finish the work in 4 days, in how many days Bhagat alone can finish the work? **[2]**

18. If a man walks 1 km/hr faster than his usual speed then he covers a distance of 3 km in 15 minutes less time. Find his usual speed. (In km/hr) **[2]**

19. Speed of a boat in still water is 15 km/hour. It goes 30 km up stream and returns at the same point in 4 hours 30 minutes. Find the speed of the stream. (In km/hr) **[2]**

20. A motorboat whose speed in still water is 18 km/h, takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream. (In km/h) **[2]**

21. One fourth of a herd of camels was seen in forest. Twice of square root of the herd had gone to mountains and remaining 15 camels were seen on the bank of a river, find the total number of camels. **[2]**

22. One year ago, a man was 8 times as old as his son. Now his age is equal to the square of his son's age. Find their present ages. **[2]**

23. The sum of the reciprocals of Varun's age (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age. **[2]**

24. The product of Rehan's age (in years) 5 years ago and his age 7 years from now, is one more than twice his present age. Find his present age. **[2]**

25. A train covers a distance of 480 km at a uniform speed. If the speed had been 8 km/hr less then it would have taken 3 hours more to cover the same distance. Find the usual speed of the train. **[2]**

26. A fast train takes one hour less than a slow train for a journey of 200 km. If the speed of the slow train is 10 km/hr less than that of the fast train, then, find the speed of the two trains. **[2]**

27. A chessboard contains 64 equal squares and the area of each square is 6.25 cm^2. A border round the board is 2 cm wide. Find the length of the side of the chessboard. **[2]**

28. A shopkeeper buys a number of books for Rs 1200. If he had bought 10 more books for the same amount, each book would have cost him RS 20 less. How many books did he buy ? **[2]**

29. The length of a rectangular field is 30 m more than its breadth and the diagonal is 60 m more than its breadth. **[2]**

Find the dimensions of the field.

30. Sum of the areas of two squares is 468 m^2. If the difference between their sides is 6 m, then find the sides of the two squares. **[2]**

31. The age of father is equal to the square of the age of his son. The sum of the age of father and five times the age of the son is 66 years. Find their ages. **[2]**

32. Two water taps together can fill a tank in $3\frac{1}{3}$ hours. The tap of larger diameter takes 5 hours less than the smaller one to fill the tank separately. Find the time in which each tap can fill the tank separately. **[2]**

33. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight was increased by 30 minutes. Find the duration of flight. **[2]**

34. A and B working together can do a work in 6 days. If A takes 5 days less than B to finish the work, in how many days B alone can do it? **[2]**

35. Had Ajita scored 10 more marks in her mathematics test out of 30 marks, 9 times these marks would have been the square of her actual marks. How many marks did she get in the test? **[2]**

36. The time taken by a person to cover 150 km was $2\frac{1}{2}$ hours more than the time taken in the return journey. If he returned at a speed of 10 km/hour more than the speed while going, find the speed per hour in each direction. **[2]**

37. In a class test Raveena got a total of 30 mark in English and Mathematics. Had she got 2 more marks in Mathematics and 3 marks less in English then the product of her marks obtained would have been 210. Find the individual marks obtained in two subjects.38319 **[2]**

38. The sum of ages (in years) of a son and his father is 35 years and product of their ages is 150 years, find their ages. **[2]**

39. Two taps running together can fill a tank in $3\frac{1}{13}$ hours. If one tap takes 3 hours more than the other to fill the tank, then how much time will each tap take to fill the tank? **[2]**

Section C

Question No. 40 to 43 are based on the given text. Read the text carefully and answer the questions: **[4]**

While designing the school year book, a teacher asked the student that the length and width of a particular photo is increased by x units each to double the area of the photo. The original photo is 18 cm long and 12 cm wide.

40. Write an algebraic equation depicting the above information.

41. Write the corresponding quadratic equation in standard form.

42. What should be the new dimensions of the enlarged photo?
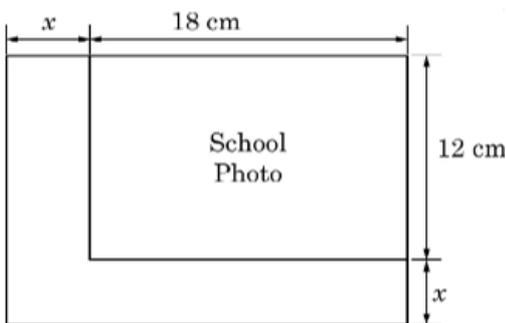
43. Can any rational value of x make the new area equal to 220 cm^2?

Section D

44. If the price of a book is reduced by ₹ 5, a person can buy 4 more books for ₹ 600. Find the original price of the book. **[5]**

45. A journey of 192 km from a town A to town B takes 2 hours more by an ordinary passenger train than a super fast train. If the speed of the faster train is 16 km/h more, find the speed of the faster and the passenger train. **[5]**

46. A truck covers a distance of 150 km at a certain average speed and then covers another 200 km at an average speed which is 20 km per hour more than the first speed. If the truck covers the total distance in 5 hours, then find the first speed of the truck. **[5]**

47. A train travels at a certain average speed for a distance 63 km and then travels a distance of 72 km at an average speed of 6 km/hr more than the original speed. If it takes 3 hours to complete total journey, what is its original average speed? **[5]**

48. The sum of the ages of a father and his son is 45 years. Five years ago, the product of their ages (in years) was 124. Determine their present age. **[5]**

49. A shopkeeper buys a number of books for Rs.1200. If he had bought 10 more books for the same amount, each book would have cost him Rs.20 less. Find how many books did he buy? **[5]**

50. A train travels at a certain average speed for a distance of 360 km. It would have taken 48 minutes less to travel the same distance if its speed was 5 km/hour more. Find the original speed of the train. **[5]**

51. A piece of cloth costs 200 Rupees . If the piece was 5 m longer and each metre of cloth costs 2 Rupees less, the cost of the piece would have remain unchanged. How long is the piece and what is the original rate per metre? **[5]**

52. A train takes 2 hours less for a journey of 300 km if its speed is increased by 5 km/hr from its usual speed. Find the usual speed of the train. **[5]**

53. At t minutes past 2 p.m, the time needed by the minute hand of a clock to show 3 p.m. was found to be 3 minutes less than $\frac{t^2}{4}$ minutes. Find t. **[5]**

54. John and Jivanti together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124. Form the quadratic equation to find how many marbles they had to start with, if John had 'x' marbles. **[5]**

55. A plane left 30 minutes later than the scheduled time and in order to reach its destination 1500 km away on time, it has to increase its speed by 250 km/hr from its usual speed. Find the usual speed of the plane. **[5]**

56. A girl is twice as old as her sister. Four years hence, the product of their ages (in years) will be 160. Find their present ages **[5]**

57. A dealer sells a toy for ₹ 24 and gains as much per cent as the cost price of the toy. Then find the cost price of the toy.38319 **[5]**

58. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream, than to return to the same point. Find the speed of the stream and total time of the journey. **[5]**

59. Swati can row her boat at a speed of 5 km/hr in still water. If it takes her 1 hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the stream. **[5]**

60. Two pipes running together can fill a tank in $11\frac{1}{9}$ minutes. If one pipe takes 5 minutes more than the other to fill the tank, find the time in which each pipe would fill the tank separately. **[5]**

61. If the price of a book is reduced by ₹5, a person can buy 5 more books for ₹ 300. Find the original list price of the book. **[5]**

62. In the centre of a rectangular lawn of dimensions 50 m × 40 m, a rectangular pond has to be constructed so that the area of the grass surrounding the pond would be 1184 m². Find the length and breadth of the pond **[5]**
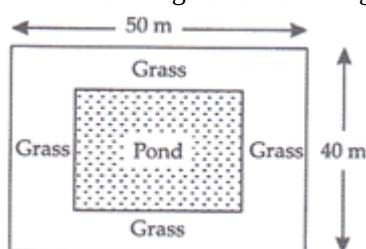
63. A train travels at a certain average speed for a distance of 54 km and then travels a distance of 63 km at an average speed of 6 km/h more than the first speed. If it takes 3 hours to complete the total journey, what was its first average speed? **[5]**

64. 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. **[5]**

65. The difference of squares of two numbers is 204. The square of the smaller number is 4 less than 10 times the larger number. Find the two numbers. **[5]**

66. The sum of the ages of a father and his son is 45 years. Five years ago, the product of their ages was four times the father's age at that time. Find their present ages. **[5]**

67. Sum of the areas of two squares is 452 m^2. If the difference of their perimeters is 8 m, find the sides of the two squares. **[5]**

68. 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 ₹ 90, find the number of articles produced and the cost of each article. **[5]**

69. Amisha bought a number of books for ₹ 1,800. If she had bought 10 more books for the same amount, each book would have cost her ₹ 30 less. How many books did she buy originally? **[5]**

70. The sum of reciprocals of Roohi's age (in years) 3 years ago and 5 years hence from now is $\frac{1}{3}$ Find her present age. **[5]**

71. A and B jointly finish a piece of work in 15 days. When they work separately, A takes 16 days less than the number of days taken by B to finish the same piece of work. Find the number of days taken by B to finish the work. **[5]**

72. ₹ 9000 were divided equally among a certain number of persons. Had there been 20 more persons, each would have got ₹ 160 less. Find the original number of persons. **[5]**

73. A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of toys produced in a day. On a particular day, the total cost of production was ₹ 750. We would like to find out the number of toys produced on that day. Represent the situations mathematically (quadratic equation). **[5]**

74. A person on tour has ₹ 4200 for his expenses. If he extends his tour for 3 days, he has to cut down his daily expenses by ₹ 70. Find the original duration of the tour. **[5]**

75. The product of Tanay's age (in years) five years ago and his age ten years later is 16. Determine Tanay's present age. **[5]**