#### Worksheet

### Problem – 1.

If  $x = k\sqrt{3}$  is a solution of the quadratic equation  $x^2 + \frac{x}{\sqrt{3}} - 4 = 0$ , then find the value of k.

# Problem – 2.

Find the discriminant of the quadratic equation  $2x^2 - 5x - 3 = 0$ .

# Problem – 3.

For what value of 'a', the quadratic equation  $ax^2 - 2ax + 2a + 1 = 0$  has repeated roots?

# Problem – 4.

For what value of 'k', the quadratic equation  $2x^2 + 2kx + \sqrt{2k} = 0$  has equal roots?

# Problem – 5.

What is the value of  $\sqrt{12 + \sqrt{12 + \sqrt{12}}}$ ?

### Problem – 6.

In a right  $\triangle ABC$ , right angled at *B*, if AB = 7x + 3, BC = 3x - 2 and CA = 9x - 2, then find the value of *x*.

# Problem – 7.

Show that x = 2 is a solution of  $3x^2 - 13x + 14 = 0$ .

# Problem – 8.

For what value of *k* does the equation  $9x^2 + 13x + 8 = 0$  has equal roots?

# Problem – 9.

Find the roots of the quadratic equation  $5x^2 + 13x + 8 = 0$  using quadratic formula.

### Problem – 10.

Find the roots of the quadratic equation  $\frac{2}{5}x^2 - x - \frac{3}{5} = 0$  by the factorisation method.

# Problem – 11.

Solve the quadratic equation  $2x^2 + ax - a^2 = 0$ .

### Problem – 12.

Find the values of *p* for which the quadratic equation  $4x^2 + px + 3 = 0$  has equal roots.

# Problem – 13.

Is 0.2 a root of the equation  $x^2 = 0.4 = 0$ ? Justify.

### Problem – 14.

Write the condition to be satisfied for which equation  $ax^2 + 2bx + c = 0$  and  $bx^2 - 2$  $\sqrt{acx} + b = 0$  have equal roots.

# Problem – 15.

If equation  $ax^2 + bx + c = 0$  has equal roots, then find 'c' in terms of 'a' and 'b'.

### Problem – 16.

Write the set of values of k for which the quadratic equation  $2x^2 + kx + 8 = 0$  has real roots.

#### Problem – 17.

Find the values of *p* and *q* for which  $x = \frac{3}{4}$  and x = -2 are the roots of the equation  $px^2 + qx - 6 = 0$ .

### Problem – 18.

If one root of the quadratic equation  $2x^2 + kx - 6 = 0$  is 2, find the value of k. Also, find the other root.

# Problem – 19.

Solve: 
$$\frac{4}{x} - 3 = \frac{5}{(2x+3)}, x \neq 0, \frac{-3}{2}$$

# Problem – 20.

Solve:  $\frac{x}{x-1} + \frac{x-1}{x} = 4, x \neq 0, x \neq 1.$ 

#### Problem – 21.

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.

### Problem – 22.

Show that the equation  $x^2 + px - 1 = 0$  has real and distinct roots for all real values of *p*.

### Problem – 23.

If the roots of the equation  $(a^2 + b^2)x^2 - 2(ac + bd)x + (c^2 + d^2) = 0$  are equal, prove that  $\frac{a}{b} = \frac{c}{d}$  or ad = bc.

# Problem – 24.

Divide 12 into two parts such that the sum of their squares is 74.

# Problem – 25.

Solve:  $9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$ .

### Problem – 26.

Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.

### **Problem – 27.**

A natural number, when increased by 12, equals 160 times its reciprocal. Find the number.

### Problem – 28.

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

#### Problem – 29.

Prove that both the roots of the equation (x-a)(x-b) + (x-b)(x-c) + (x-c)(x-a) = 0are real but they are equal only when a = b = c.

### Problem – 30.

A two–digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.

### Problem – 31.

The sides (in cm) of a right triangle containing the right angle are 3(x + 1) and (2x - 1). If the area of triangle is 30 sq. cm, find the sides of the triangle.

# Problem – 32.

The distance between Mumbai and Pune is 192 km. Travelling by the Deccan Queen, it takes 48 minutes less than another train. Calculate the speed of the Deccan Queen, if the speeds of the two trains differ by 20 km/hr.

