Quadratic Equations

Represent the following situations with suitable mathematical equations.

Check whether the following are quadratic equations:
i. (x – 2)2 + 1 = 2x – 3 ii. x(x + 1) + 8 = (x + 2) (x – 2)
iii. x (2x + 3) = x2 + 1 iv. (x + 2)3 = x3 – 4

Check whether the following are quadratic equations :
i. (x + 1)2 = 2(x – 3) ii. x2 – 2x = (–2) (3 – x)
iii. (x – 2)(x + 1) = (x – 1)(x + 3) iv. (x – 3)(2x +1) = x(x + 5)
v. (2x – 1)(x – 3) = (x + 5)(x – 1) vi. x2 + 3x + 1 = (x – 2)2
vii. (x + 2)3 = 2x (x2 – 1) viii. x3 – 4x2 – x + 1 = (x – 2)3

Represent the following situations in the form of quadratic equations :
i. The area of a rectangular plot is 528 m2. The length of the plot is one metre mo
twice its breadth. We need to find the length and breadth of the plot.
ii. The product of two consecutive positive integers is 306. We need to find the in
iii. Rohan's mother is 26 years older than him. The product of their ages after 3 y
be 360 years. We need to find Rohan's present age.
iv. A train travels a distance of 480 km at a uniform speed. If the speed had been
less, then it would have taken 3 hours more to cover the same distance. We nee
find the speed of the train.

Find the roots of the following equations using factorisation method.
(i) x2 + 5x + 6 = 0 (ii) x2 - 5x + 6= 0
(iii) x2 + 5x - 6 = 0 (iv) x2 - 5x – 6= 0

Find the roots of the following quadratic equations by factorisation:
i. x2 – 3x – 10 = 0 ii. 2x2 + x – 6 = 0 iii. 2x2 + 7x + 5 2 = 0
iv. 2 2 1 0
8
x - x + = v. 100x2 – 20x + 1 = 0 vi. x(x + 4) = 12
vii. 3x2 – 5x + 2 = 0 viii.
x - 3 = 2
x (x ¹ 0) ix. 3(x – 4)2 – 5(x – 4) = 12

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

Find two consecutive positive integers, sum of whose squares is 613.

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

5. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the 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.

6. Find the dimensions of a rectangle whose perimeter is 28 meters and whose area is 40 square meters.

7. The base of a triangle is 4cm longer than its altitude. If the area of the triangle is 48 sq.cm then find its base and altitude.

8. Two trains leave a railway station at the same time. The first train travels towards west and the second train towards north. The first train travels 5 km/hr faster than the second train. If after two hours they are 50 km. apart, find the average speed of each train.

9. In a class of 60 students, each boy contributed rupees equal to the number of girls and each girl contributed rupees equal to the number of boys. If the total money then collected was D1600. How many boys were there in the class?

10. A motor boat heads upstream a distance of 24 km in a river whose current is running at 3 km per hour. The trip up and back takes 6 hours. Assuming that the motor boat maintained a constant speed, what was its speed in still water?