

# Activity 2

## OBJECTIVE

To draw the graph of a quadratic polynomial and observe:

- (i) The shape of the curve when the coefficient of  $x^2$  is positive.
- (ii) The shape of the curve when the coefficient of  $x^2$  is negative.
- (iii) Its number of zeroes.

## MATERIAL REQUIRED

Cardboard, graph paper, ruler, pencil, eraser, pen, adhesive.

## METHOD OF CONSTRUCTION

1. Take cardboard of a convenient size and paste a graph paper on it.
2. Consider a quadratic polynomial  $f(x) = ax^2 + bx + c$
3. Two cases arise:

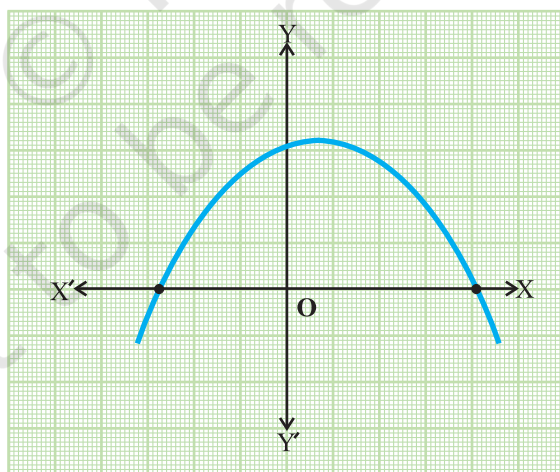
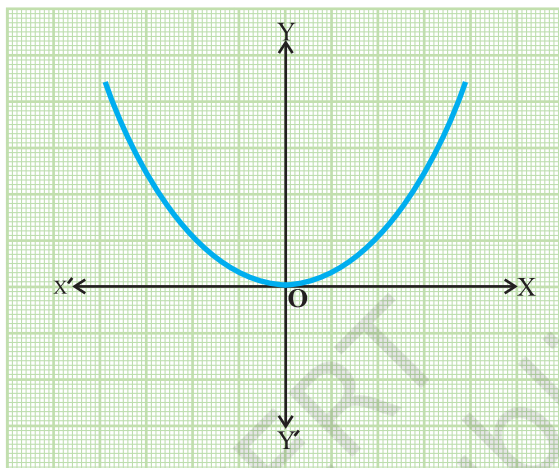


Fig. 1

- (i)  $a > 0$                       (ii)  $a < 0$

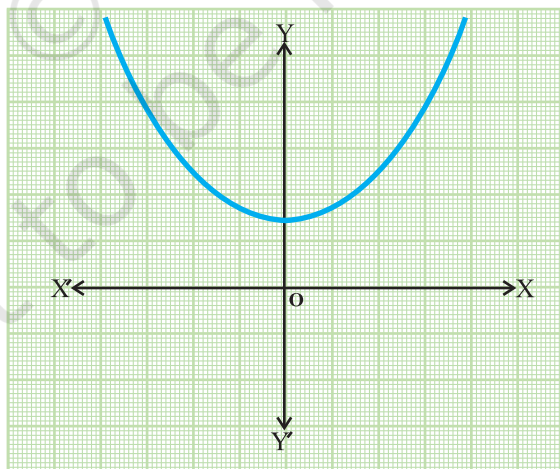
4. Find the ordered pairs  $(x, f(x))$  for different values of  $x$ .

5. Plot these ordered pairs in the cartesian plane.



**Fig. 2**

6. Join the plotted points by a free hand curve [Fig. 1, Fig. 2 and Fig. 3].



**Fig. 3**

## DEMONSTRATION

1. The shape of the curve obtained in each case is a parabola.
2. Parabola opens upward when coefficient of  $x^2$  is positive [see Fig. 2 and Fig. 3].
3. It opens downward when coefficient of  $x^2$  is negative [see Fig. 1].
4. Maximum number of zeroes which a quadratic polynomial can have is 2.

## OBSERVATION

1. Parabola in Fig. 1 opens \_\_\_\_\_
2. Parabola in Fig. 2 opens \_\_\_\_\_
3. In Fig. 1, parabola intersects  $x$ -axis at \_\_\_\_\_ point(s).
4. Number of zeroes of the given polynomial is \_\_\_\_\_.
5. Parabola in Fig. 2 intersects  $x$ -axis at \_\_\_\_\_ point(s).
6. Number of zeroes of the given polynomial is \_\_\_\_\_.
7. Parabola in Fig.3 intersects  $x$ -axis at \_\_\_\_\_ point(s).
8. Number of zeroes of the given polynomial is \_\_\_\_\_.
9. Maximum number of zeroes which a quadratic polynomial can have is \_\_\_\_\_.

## APPLICATION

This activity helps in

1. understanding the geometrical representation of a quadratic polynomial
2. finding the number of zeroes of a quadratic polynomial.

### NOTE

Points on the graph paper should be joined by a free hand curve only.