Activity 12

OBJECTIVE

To obtain a quadratic function with the help of linear functions graphically.

MATERIAL REQUIRED

Plywood sheet, pieces of wires.

METHOD OF CONSTRUCTION

1. Take two wires of equal length.

2. Fix them at O in a plane (on the plywood sheet) at right angle to each other to represent x-axis and y-axis (see Fig.12)

3. Take a piece of wire and fix it in such a way that it meets the x-axis at a distance of a units from O in the positive direction and meets y-axis at a distance of a units below O as shown in the figure. Mark these points as B and A, respectively.
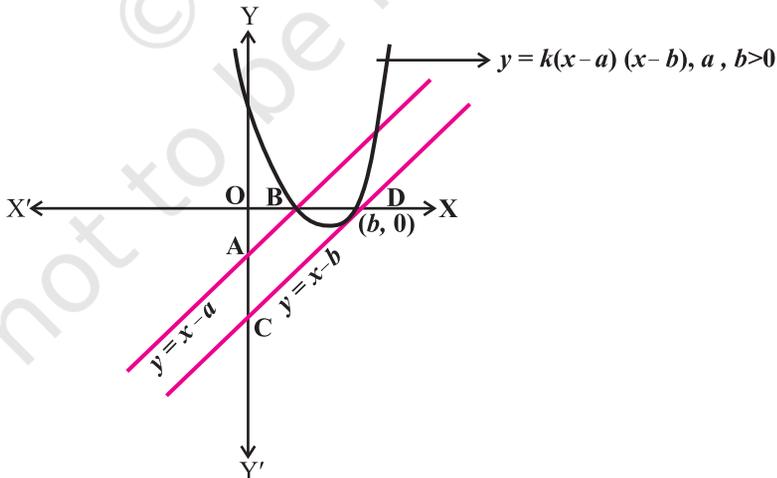

Fig. 12

4. Similarly, take another wire and fix it in such a way that it meets the *x*-axis at a distance of *b* units from O in the positive direction and meets *y*-axis at a distance of *b* units below O as shown in the Fig.12. Mark these points as D and C, respectively.

5. Take one more wire and fix it in such a way that it passes through the points where straight wires meet the *x*-axis and the wire takes the shape of a curve (parabola) as shown in the Fig.12.

DEMONSTRATION

1. The wire through the points A and B represents the straight line given by $y = x - a$ intersecting the *x* and *y*-axis at $(a, 0)$ and $(0, - a)$, respectively.

2. The wire through the points C and D represents the straight line given by $y = x - b$ intersecting *x* and *y* axis at $(b, 0)$ and $(0, - b)$, respectively.

3. The wire through B and D represents a curve given by the function $y = k (x - a) (x - b) = k [x^2 - (a + b) x + ab]$, where *k* is an arbitrary constant.

OBSERVATION

1. The line given by the linear function $y = x - a$ intersects the *x*-axis at the point _____ whose coordinates are _____.

2. The line given by the linear function $y = x - b$ intersects the *x*-axis at the point _____ whose coordinates are _____.

3. The curve passing through B and D is given by the function $y =$ _____, which is a _____ function.

APPLICATION

This activity is useful in understanding the zeroes and the shape of graph of a quadratic polynomial.

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