

Sketching the Graph of Quadratic Equation

Example

Sketch the graph for the quadratic function $y = 2x^2 + 2x + 2$.

Solution:

Step 1:

Determine the type of graph.

$a > 0$ so this is a minimum graph

Step 2:

Solve by completing square

$$y = 2x^2 + 4x + 2$$

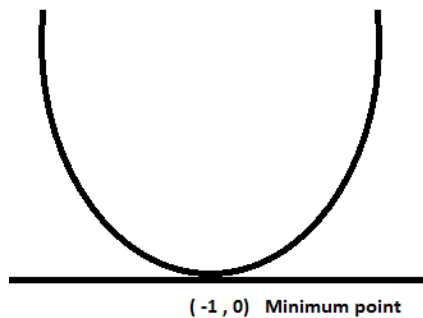
$$y = 2(x^2 + 2x + 1)$$

$$y = 2[x^2 + 2x + (1)^2 - (1)^2 + 1]$$

$$y = 2[(x + 1)^2]$$

$$y = 2(x + 1)^2$$

Minimum point is $(-1, 0)$



Step 3:

When the function intercept- x , $y=0$

$$0 = 2(x + 1)^2$$

$$0 = (x + 1)^2$$

$$0 = x + 1$$

$$x = -1$$

1. Given the following equation below, sketch the graph and determine the maximum and minimum points using completing squared method

a) $y = x^2 + x - 6$

b) $y = x^2 - 7x + 12$

c) $y = 2x^2 + 9x + 4$

d) $y = x^2 + 6x + 8$

SIMULTANEOUS EQUATION

Solve the following simultaneous equation

$$2y = x + 4$$

$$x + y = 10$$

Solution:

$$2y = x + 4 \dots\dots\dots (1)$$

$$x + y = 10 \dots\dots\dots (2)$$

From (1)

$$x = 2y - 4 \dots\dots\dots (3)$$

Substitute (3) into (2)

$$2y - 4 + y = 10$$

$$y = 10 + 4 = 14$$

$$x = 2(14) - 4 = 24$$

Solve the following Questions. Find the value for 'x' and 'y'

a) $2y = 2x + 4$, $x + y = 10$

b) $y = x + 3$, $x + y = 10$

c) $x^2 + 2y = 5$, $x + y^2 = 100$

d) $x^2 + y^2 = 30$, $y + x = 5$