

## 2021 O-LEVEL MATHEMATICS SUBJECT-BASED STRATEGIES

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One topic that students tend to make mistakes is on Sketching Graphs of Quadratic Equations.

There are two types of Graph Sketching, and here are the steps for each of them.

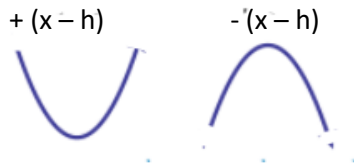
**Quadratic equation has undergone completing the square**

**eg.  $y = \pm(x - h)^2 + k$**

### Steps

1. Identify shape of curve.

- look at sign in front of  $(x - h)$  to determine if it is "smiley face" or "sad face".



2. Find turning point

- The maximum or the minimum point has the coordinates of  $(h, -k)$

3. Find y-intercept

- sub  $x = 0$  into the equation to find the vertical intercept.

4. Line of symmetry

- substitute  $x = h$ , to get  $(2x, y)$

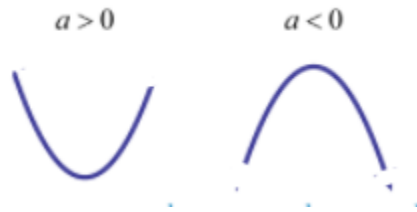
**Quadratic equation has been factorized.**

eg.  $y = +/- (x - a)(x - b)$

### Steps

1. Identify shape of curve

- look at the formula  $ax^2 + bx + c$ .
- if  $a > 0$ , it is positive; otherwise, it is negative



2. Find turning point

- Find  $(a + b)/2$  and substitute answer into equation to get the coordinate of the turning point.

3. Find y-intercept

- sub  $x = 0$  into the equation to find the vertical intercept.

4. Line of symmetry reflect

- substitute  $x = a$ , to get  $(2a, y)$

Use these simple steps and Graph Sketching will no longer be a challenge anymore.