

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

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

$$= x^2 - 2x + 3$$

find Axis of symmetry ✓
Vertex ✓
Sketch ✓

find a, b, c

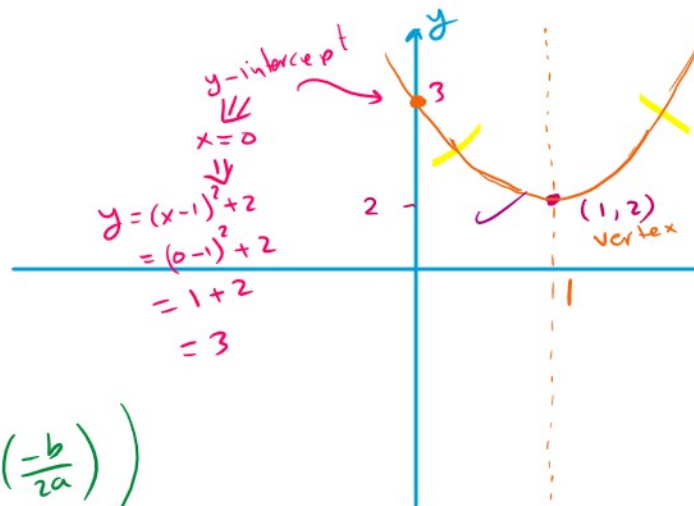
$$y = ax^2 + bx + c$$

$a = 1$, $b = -2$, $c = 3$

$a > 0$
↓
parabola opens up

✓
Vertex min

Axis of symmetry $x = -\frac{b}{2a} = -\frac{-2}{2(1)} = 1$



$$\Delta = b^2 - 4ac$$

$$= (-2)^2 - 4(1)(3)$$

$$= 4 - 12$$

$$= -8 < 0$$

∴ no x-intercept

vertex is $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

$$= (1, f(1))$$

$$= (1, 2)$$

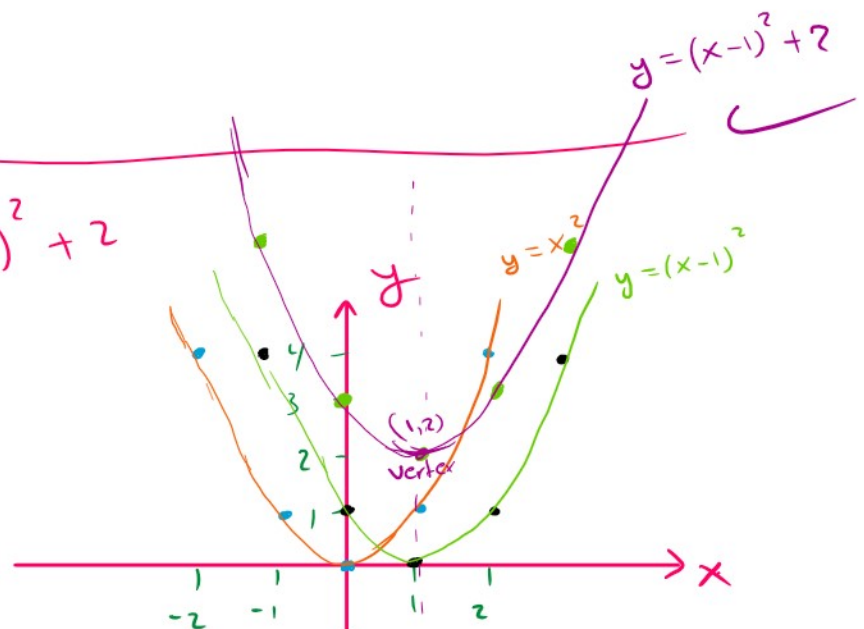
$x = 1$ axis of symmetry

table

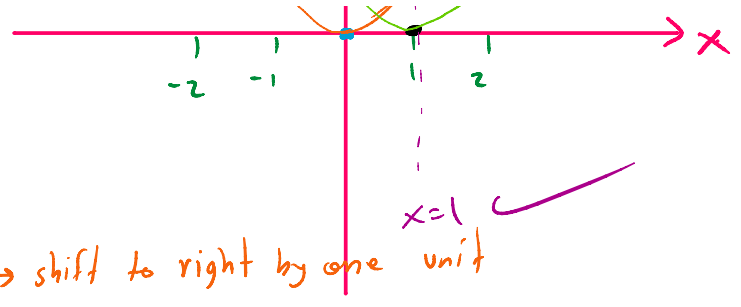
$y = x^2$

x	y
-2	4
-1	1
0	0

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



-1	1
0	0
1	1
2	4



$$y = x^2$$

$$y = (x-1)^2 \rightarrow \text{shift to right by one unit}$$

$$y = \underline{(x-1)^2} + 2 \text{ shift up by 2 units}$$

← + → -

+ ↑

- ↓