How to find an equation from vertex and point

- A parabola passes has its **vertex at (1,3)** and passes through the **point (0,1)**. What is the equation of this parabola?

- (h,k)=(1,3)
- (x$_1$,y$_1$)=(0,1)

My formula is true for every x,y; not just x$_1$,y$_1$

$$y = a(x-h)^2 + k$$

$$y = a(x-1)^2 + 3$$

$$y_1 = a(x_1 - 1)^2 + 3$$

$$1 = a(0-1)^2 + 3$$

$$-2 = a(1)$$

$$a = -2$$

$$y = -2(x-1)^2 + 3$$