

Chapter 3.1: Quadratic Functions and Applications

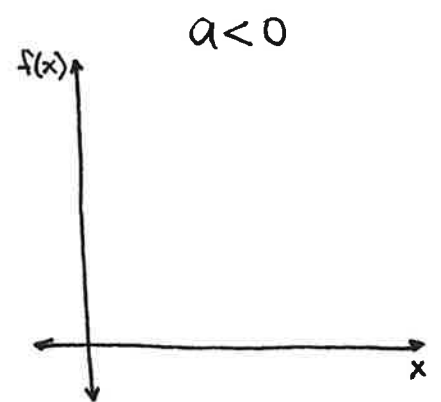
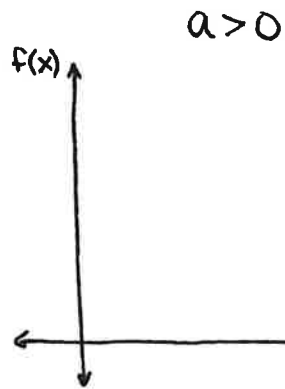
$$f(x) = ax^2 + bx + c$$

VERTEX

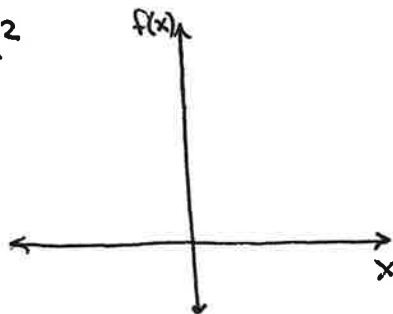
AXIS OF SYMMETRY

X-INTERCEPT

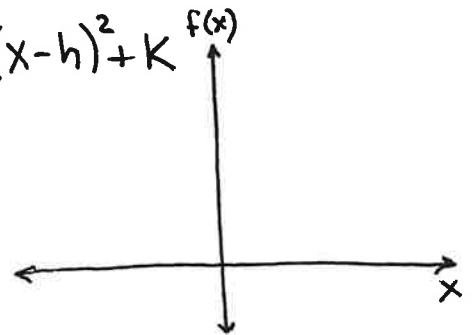
Y-INTERCEPT



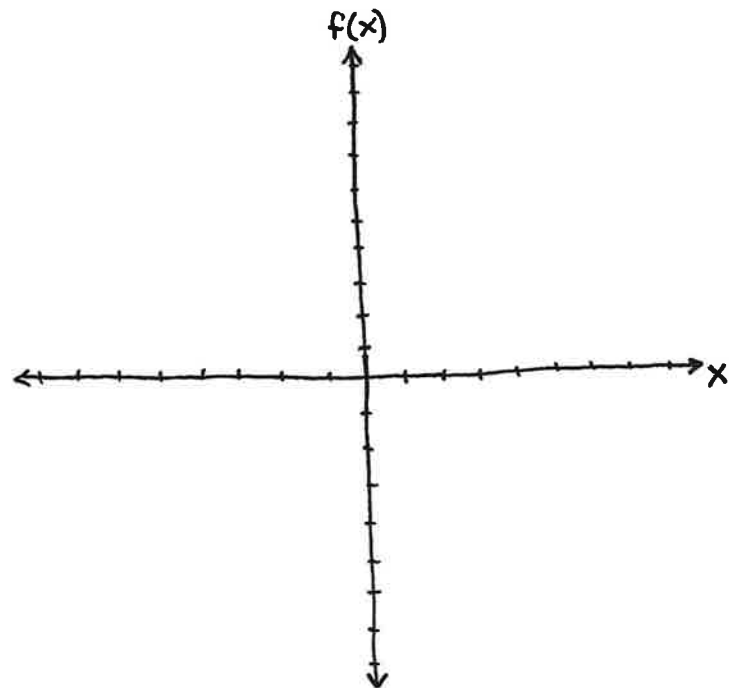
$$f(x) = ax^2$$



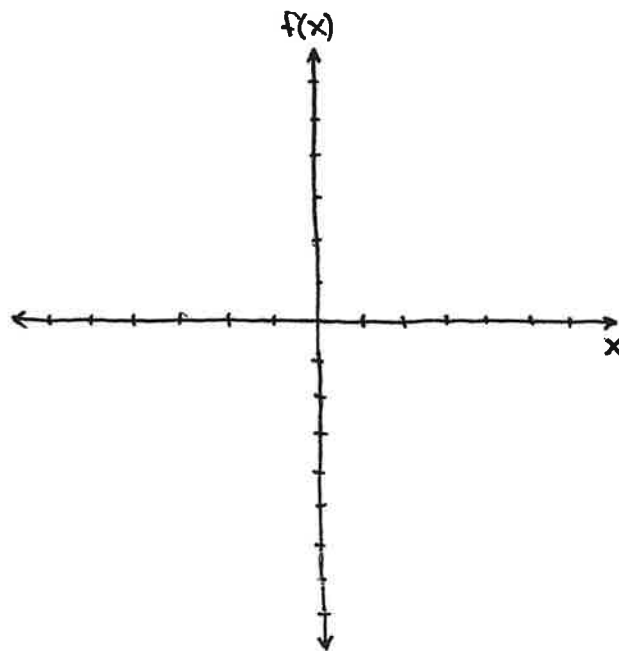
$$f(x) = a(x-h)^2 + k$$



GRAPH $f(x) = -2(x-1)^2 + 8$



WRITE $f(x) = 3x^2 + 12x + 5$ IN VERTEX FORM AND SKETCH THE GRAPH.

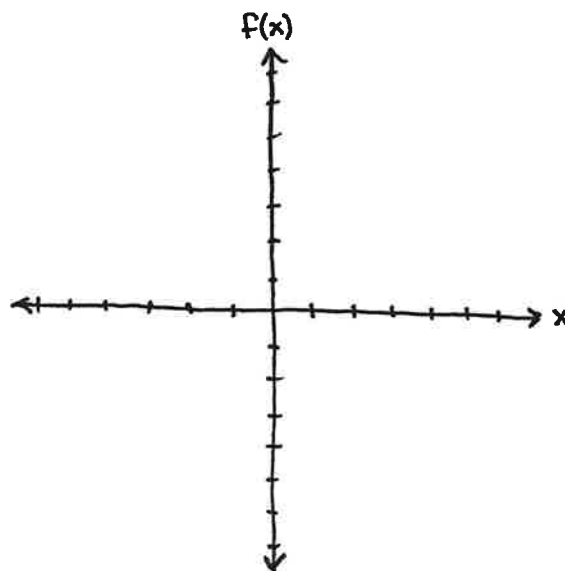


$$f(x) = ax^2 + bx + c$$

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

$$(h, k) \quad h = -\frac{b}{2a} \quad k = \frac{4ac - b^2}{4a} \quad (h, k) = \left[-\frac{b}{2a}, f\left(-\frac{b}{2a}\right) \right]$$

GRAPH $f(x) = -x^2 + 4x - 5$.



Parabola Practice

A ball is thrown upwards out of a window 160 feet above the ground. The ball's height, h feet above the ground at time t seconds, is given by the following equation.

$$h(t) = -16t^2 + 48t + 160$$

Find the ball's maximum height.