Quadratic function

Linear function

$$f: \mathbb{R} \rightarrow \mathbb{R}$$
$$x \rightarrow y = f(x) = a \cdot x + b \qquad (a, b \in \mathbb{R})$$

Quadratic function

$$f: \mathbb{R} \rightarrow \mathbb{R}$$
$$x \rightarrow y = f(x) = a \cdot x^2 + b \cdot x + c \qquad (a, b, c \in \mathbb{R};\ a \neq 0)$$

general form

$$y = f(x) = a \cdot (x - u)^2 + v \qquad (a, u, v \in \mathbb{R};\ a \neq 0)$$

vertex form