

- Quadratic Graphs transforming $f(x) = ax^2 + bx + c$ in to standard form $y = a(x-h)^2 + k$. The vertex is $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$ if in the first form but (h, k) in the second form. Axis of symmetry is $x = \frac{-b}{2a}$ and $x = h$ respectively.

If $a > 0$, graph has a minimum of: $f\left(\frac{-b}{2a}\right)$ or k If $a < 0$, graph has a maximum of: $f\left(\frac{-b}{2a}\right)$ or k

Examples, Put in standard form, state vertex, axis of symmetry, maximum or minimum along with domain and range.

$$f(x) = x^2 + 10x - 3$$

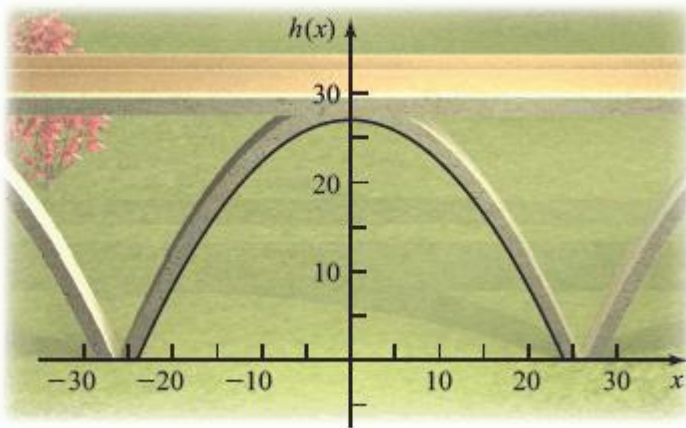
$$f(x) = -2x^2 - 4x + 5$$

$$f(x) = x^2 - 18x$$

$$f(x) = x^2 - 18$$

$$f(x) = 2x^2 + 3x + 1$$

The height of an arch is given by $f(x) = -\frac{3}{64}x^2 + 27$, $-24 \leq x \leq 24$ where $|x|$ is the horizontal distance in feet from the center of the arch to the ground.



(a) What is the maximum height of the arch?

(b) What is the height of the arch 5 feet to the right of center?

(c) How far from the center is the arch 7 feet tall? (Round your answer to one decimal place.)