

Ex. 1: Find the vertex of the function

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

(Note: In the original image, '2' is circled in red and labeled 'a', and '-8' is circled in green and labeled 'b'.)

$$x = -\frac{b}{2a}$$

$$x = -\frac{-8}{2 \cdot 2}$$

$$x = \frac{8}{4} = 2$$

$$f(2) = 2 \cdot 2^2 - 8 \cdot 2 + 1$$

$$= 2 \cdot 4 - 16 + 1$$

$$= 8 - 16 + 1 = -7$$

$$\text{Vertex} = (2, -7)$$