

Find the **vertex** of the **quadratic equation** using *various methods*.

$$f(x) = 2x^2 - 4x + 6 \quad \updownarrow \quad ax^2 + bx + c = 0$$

$$f'(x) = 2(2)x - 4(1) + 0$$

$$f'(x) = 4x - 4$$

$$\begin{array}{r} 0 = 4x - 4 \\ +4 \quad \quad +4 \\ \hline 4 = 4x \end{array}$$

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

$$1 = x$$

$$f(1) = 2(1)^2 - 4(1) + 6$$

$$= 2 - 4 + 6$$

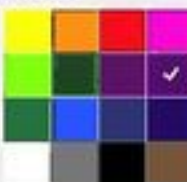
$$= 8 - 4 = 4 \quad \boxed{(1, 4)}$$

$$\left( -\frac{b}{2a}, f\left(-\frac{b}{2a}\right) \right)$$

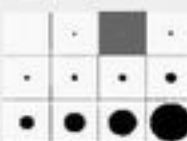
$$\begin{aligned} x &= -\left(\frac{-4}{2(2)}\right) = -\left(\frac{-4}{4}\right) \\ &= -(-1) \\ &= 1 \end{aligned}$$

$$\begin{aligned} f(1) &= 4 \\ \boxed{(1, 4)} \end{aligned}$$

Pen Color



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