

1.

Solution

To find the vertex, we look at the coefficients in the function $j(q) = aq^2 + bq + c$ in this equation, $a = 2$ and $b = 6$

The first coordinate of the vertex has the formula: $\frac{-b}{2a}$ now, plugging into formula to get:

$$\frac{-b}{2a} = -\frac{6}{2(2)} = -\frac{3}{2}$$

$$\begin{aligned}\text{The second coordinate of the vertex is } j\left(-\frac{3}{2}\right) &= 2\left(-\frac{3}{2}\right)^2 + 6\left(-\frac{3}{2}\right) - 4 \\ &= -\frac{17}{2}\end{aligned}$$

Therefore, the vertex of the graph of f is $\left(-\frac{3}{2}, -\frac{17}{2}\right)$