4.

Solution

To find the vertex, we look at the coefficients in the function $q(m)=am^2+bm+c$
in this equation, $a=2$ and $b=4$
The first coordinate of the vertex has the formula: $\frac{-b}{2a}$ now, plugging into formula to get:
$\frac{-b}{2a}=-\frac{4}{2(2)}=-1$
The second coordinate of the vertex is $q(-1)=2(-1)^2+4(-1)-3$
$=-5$
Therefore, the vertex of the graph of f is $(-1,-5)$