1.

Solution

To find the vertex, we look at the coefficients in the function $j(g)=ag^2+bg+c$
in this equation, $a=3$ and $b=8$
The first coordinate of the vertex has the formula: $\frac{-b}{2a}$ now, plugging into formula to get:
$\frac{-b}{2a}=-\frac{8}{2(3)}=-\frac{4}{3}$
The second coordinate of the vertex is $j(-\frac{4}{3}) = 3(-\frac{4}{3})^2+8(-\frac{4}{3})-4$
$=-\frac{28}{3}$
Therefore, the vertex of the graph of f is $(-\frac{4}{3},-\frac{28}{3})$