4.

Solution

To find the vertex, we look at the coefficients in the function $g(f)=af^2+bf+c$
in this equation, $a=2$ and $b=8$
The first coordinate of the vertex has the formula: $\frac{-b}{2a}$ now, plugging into formula to get:
$\frac{-b}{2a}=-\frac{8}{2(2)}=-2$
The second coordinate of the vertex is $g(-2)=2(-2)^2+8(-2)-5$
$=-13$
Therefore, the vertex of the graph of f is $(-2,-13)$