8. (8 points) Below are the graphs of two functions f and g and their derivatives. Consider the function h defined by

$$h(x) = (f(x))^2 + (g(x))^2.$$

Find approximate values for $h(2)$ and $h'(2)$. [Show your intermediate calculations as well as your final answers below.]

- $h(2) \approx$ 3.25, [Since: $h(2) = (f(2))^2 + (g(2))^2 \simeq 1^2 + (-1.5)^2 = 3.25$].

- $h'(2) \approx$ 13, [Since: $h'(2) = 2f(2)f'(2) + 2g(2)g'(2) \simeq 2(1)(8) + 2(-1.5)(1) = 13$].