Question 1[2 points]: Find $f'(1)$ for the function

$$f(x) = e^3 + e^x + x^e + \sqrt{x}.$$

Question 2 [3 points]: Suppose that $f(2) = -3$, $g(2) = 4$, $f'(2) = -2$, $g'(2) = 7$, and

$$h(x) = \frac{g(x)}{1 + f(x)}.$$

Find $h'(2)$.

Question 3 [3 points]: Find the slope of the tangent to the curve at $x = 0$,

$$y = \sqrt{\sec x + xe^{-2x}}.$$

Question 4 [2 points]: Find the limit,

$$\lim_{x \to 1} \frac{\sin(x-1)}{x^2 + x - 2}.$$