

For full credit you must show your work. Partial credit may be given for incorrect solutions if sufficient work is shown.

Use the product rule or quotient rule to compute the derivatives of the following functions. You do not need to simplify your answers. (5 + 5 pts)

1.

$$h(x) = (2x - 3)(x^2 - 6)$$

$$f(x) = 2x - 3 \rightarrow f'(x) = 2$$

$$g(x) = x^2 - 6 \rightarrow g'(x) = 2x$$

$$h'(x) = 2(x^2 - 6) + 2x(2x - 3)$$

2.

$$h(x) = \frac{e^x}{x^2 + 1}$$

$$f(x) = e^x \rightarrow f'(x) = e^x$$

$$g(x) = x^2 + 1 \rightarrow g'(x) = 2x$$

$$h'(x) = \frac{e^x(x^2 + 1) - 2xe^x}{(x^2 + 1)^2}$$

3. **Bonus:** Find the value(s) of x where $h'(x) = 0$ for the $h(x)$ given in Problem 1. You will need to simplify your answer to Problem 1. (2 pts)

$$h'(x) = 2(x^2 - 6) + 2x(2x - 3)$$

$$= 2x^2 - 12 + 4x^2 - 6x$$

$$= 6x^2 - 6x - 12$$

$$= 6(x^2 - x - 2)$$

$$= 6(x - 2)(x + 1)$$

$$h'(x) = 0 \Rightarrow x = 2 \text{ or } x = -1$$