
The Product and Quotient Rules

**Solutions should show all of your work, not just a single final answer.
Use only the rules that have been covered in Sections 3.1 and 3.2.**

1. Compute the derivative of each function.

(a) $f(x) = e^x(6x^2 - \sqrt{x})$

(b) $f(x) = \frac{x}{x+3}$

(c) $f(x) = \frac{e^x}{1+e^x}$

(d) $f(x) = \frac{e^x}{x^3}$

For this part, compute the derivative in two ways:

(i) using the Quotient Rule, and (ii) using the Product Rule

(e) $f(x) = \frac{1}{x} + \frac{1}{1-x}$

2. Suppose that $f(2) = 3$, $g(2) = 4$, $f'(2) = 1$, $g'(x) = -5$, find $h'(2)$.

(a) $h(x) = 2f(x) + 5g(x)$

(b) $h(x) = f(x)g(x)$

(c) $h(x) = \frac{f(x)}{g(x)}$

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