Math 2A Worksheet: 3.1/3.2 Basic Derivatives, Product & Quotient Rules

Write your names and Student ID numbers at the top of the page

1. Differentiate each function.

   (a) $f(t) = e^5$

   (b) $y = \dfrac{\sqrt{x} + x}{x^2}$

   (c) $g(x) = (x + 2\sqrt{x})e^x$

   (d) $G(x) = \dfrac{x^2 - 2}{2x + 1}$

2. At which points are the tangent lines to the curve $y = (3x - 1)(x + 2)$ horizontal?

3. Suppose $f(4) = 2$, $g(4) = 5$, $f'(4) = 6$, and $g'(4) = -3$. Find $h'(4)$ when

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

4. If f is a differentiable function, find an expression for the derivative of each of the following:

   (a) $h(x) = x^2 f(x)$

   (b) $h(x) = \dfrac{f(x)}{x^2}$

   (c) $h(x) = \dfrac{x^2}{f(x)}$