

## DIFFERENTIATION WORKSHEET II

**Exercise 1.** Find the following derivatives:

(1)  $(\sin(x) \cos(x))'$

(2)  $((2x^2 + e^x) \tan(x))'$

(3)  $\left(\frac{\cos(x)}{1 - \sin(x)}\right)'$

(4)  $\left(\frac{1 + \cos(x)}{x}\right)'$

**Exercise 2.** What is the 17th derivative of  $\sin(x)$ ?

**Exercise 3:** Using the limit definition of the derivative, show that the sum rule is true, that is, that

$$(f(x) + g(x))' = f'(x) + g'(x)$$

**Exercise 4:** Find the following derivatives:

(1)  $(x^2 \cos(x)e^x)'$

(2)  $\left(\frac{x^2 \cos(x)}{e^x}\right)'$