

# MA 16020 LESSON 19: PARTIAL DERIVATIVES (CALCULUS I REVIEW)

## DERIVATIVES FORMULAS

- Product Rule: If  $y = u(x)v(x)$ , then

$$y' = u'(x)v(x) + u(x)v'(x)$$

- Quotient Rule: If  $y = \frac{u(x)}{v(x)}$ , then

$$y' = \frac{u'(x)v(x) - u(x)v'(x)}{v^2(x)}$$

- Chain Rule: If  $y = f(g(x))$ , then

$$y' = f'(g(x)) \cdot g'(x)$$

**Exercise 1:** Find the derivative of the following:

1.  $y = \sqrt{1 - 7x^2}$

2.  $y = \tan(2x)$

3.  $y = 6 \ln(x + 3)$

4.  $y = \exp[0.05x^2]$

5.  $y = \frac{10x^2}{1-8x}$

6.  $y = \frac{x^2+x-5}{\sqrt{x-1}}$

7.  $y = (9x - 1)^5$

8.  $y = 5x^3e^{-x}$