

MA 16020 LESSON 27: 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. $y = 5x^3 e^{-x}$