

Review on Calculus

$$\frac{df(x)}{dx} = f'(x)$$

$$\frac{dc}{dx} = 0$$

c : constant

$$f(x) = c$$

$$\frac{dx}{dx} = 1$$

$$f(x) = x$$

$$\frac{df(x)}{dx} = \frac{d(2x)}{dx} = 2$$

$$\frac{d nx}{dx} = n$$

$$\frac{d x^n}{d x} = n \cdot x^{n-1}$$

$$f(x) = x^n$$

$$\frac{d x^2}{d x} = 2x$$

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

$$\frac{d 2x^2}{dx} = 2 \cdot 2 x^{2-1} = 4x$$

$$f(x) = \sqrt{x} = x^{1/2}$$

$$\frac{d x^{1/2}}{dx} = \frac{1}{2} x^{1/2-1} = \frac{1}{2} x^{-1/2} = \frac{1}{2x^{1/2}}$$

$$\frac{d \ln(x)}{dx} = \frac{1}{x}$$

$$f(x_1, x_2) = \underline{x_1^2} + \underline{x_1 x_2} + \underline{x_2^2}$$

$$\frac{\partial f(x_1, x_2)}{\partial x_1} = \underline{2x_1 + x_2}$$

$$U(M, C) = \frac{1}{2} M^2 + 2C^2$$

$$MU_M = \frac{\partial U(M, C)}{\partial M} = \frac{1}{2} 2 M^{2-1} = M$$

$$MU_C = \frac{\partial U(\cdot)}{\partial C} = 2 \cdot 2 C^{2-1} = 4C$$

