

**EG02021 Mathematics  
Class 3: Differentiation****2.7 Differential Techniques: The product and Quotient Rule:****Product Rule:**

Let,  $f(x) = x \cos x$ . Find  $f'(x)$ .

**Quotient Rule:**

$$f(x) = \frac{x^2 - 3x}{x - 1}$$

**2.8 Chain Rule**

(a)  $f(x) = (1 + x^3)^{\frac{1}{2}}$

**2.9 Higher-Order Derivatives**

For  $y = \frac{1}{x}$ , find  $d^2y/dx^2$

**3.0 Using Derivatives to Find Absolute Maximum and Minimum Values**

**Exercise: Lung Cancer:** The rate of lung and bronchus cancer per 100,000 American males since 1930 is approximated by the function

$$r(x) = -0.000775x^3 + 0.0696x^2 - 0.209x + 4.68,$$

where  $x$  is the number of years since 1930. Sketch the graph of  $r(x)$ .

**Exercise:**

Find the absolute maximum and minimum values of  $f(x) = x^3 - 3x + 2$  over the interval  $[\frac{3}{2}, \frac{3}{2}]$ .