

ASSIGNMENT III
SIBSAGAR POLYTECHNIC, MATHEMATICS
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Notes:

1. The derivative of f is denoted by $f'(x)$ or $\frac{d}{dx}(f(x))$ or if $y = f(x)$ by $\frac{dy}{dx}$ or y'
2. The process of finding derivative is called differentiation.
3. Differentiate $f(x)$ with respect to x mean $f'(x)$.
4. Algebra of derivatives
 - i. $(u \pm v)' = u' \pm v'$
 - ii. $(uv)' = u'v + uv'$ (Product or Leibnitz rule)
 - iii. $\left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$ (Quotient rule)

Problems:

1. Find the derivatives of the following functions with respect to x
 - a. $\sin 2x$
 - b. $ax^3 + bx^2 + c$, where a, b and c are constant
 - c. $\sin^2 2x$
 - d. $\sin 2x^2$
 - e. $x^3 \sin x$
 - f. $x \log x$
 - g. $e^{2x} \cos x$
 - h. $\frac{1}{x^2}$
 - i. $\tan x \sec x$
 - j. $\frac{2x}{\sin x}$