

Southern Leyte State University - Main Campus

College of Engineering

MATH 101 (Basic Calculus)

Module Three
DERIVATIVE OF A FUNCTION



CO2. Demonstrate knowledge on how to derive a function.

ILO1: Determine the theorems of differentiation.

ILO2: Determine the derivative of a function using chain rule.

Enabling Learning Outcomes:

1. Solve problems involving finding the derivative of a function.
2. Solve derivative of functions using chain rule.

Overview

This module introduces derivatives, it covers the standard derivative formula including the product rule, quotient rule and the chain rule. You will be solving problems involving these formulas.



Read and study the self-paced learning material entitled “**SPLM 3 Derivative of a Function**” attached to this module. The same copy is also available in Google Classroom.



TASK# 1. Solve problems involving finding the derivative of a function.

Problem Solving

Instructions: Evaluate the following functions. Enclose your final answer in a box.

1. $f(x) = \sqrt[5]{x}$

2. $f(x) = x + 11$

3. $f(t) = -2t^2 + 3t - 6$

4. $g(x) = x^2 + 4x^3$

5. $s(t) = t^3 + 5t^2 - 3t + 8$

6. $f(x) = x^2 + 5 - 3x^{-2}$

7. $g(t) = t^2 - \frac{4}{t^3}$

8. $f(x) = \frac{4x^3 + 3x^2}{x}$

9. $f(x) = \frac{x^3 - 3x^2 + 4}{x^2}$

10. $y = x(x^2 + 1)$

$$11. f(x) = (x^3 - x)(x^2 + 2)(x^2 + x - 1)$$

$$12. f(x) = \left(\frac{x^2 - x - 3}{x^2 + 1} \right) (x^2 + x^{-1} + 1)$$

$$13. F(x) = \sqrt[3]{\frac{3x}{x+1}} + \frac{x^2 - x - 1}{x+1}$$

$$14. f(x) = \sqrt{x} - 6\sqrt[3]{x}$$

$$15. f(x) = \frac{4 - 3x - x^2}{x^2 - 1}$$



TASK# 2. Solve derivative of functions using chain rule.

Problem Solving

Instructions: Use chain rule to find the derivative.

$$1. g(x) = \left(\frac{x + 5}{x^2 + 2} \right)^2$$

$$2. f(v) = \left(\frac{1 - 2v}{1 + v} \right)^3$$

$$3. f(x) = ((x^2 + 3)^5 + x)^2$$

$$4. f(x) = (2(x^2 + 3)^3 + (x^2 + 1)^4)^3$$

$$5. y = \frac{1}{(a + \sqrt{a - x^2})^2} \quad \text{Where } a \text{ is constant}$$



Instructions on answering

1. Write your solutions and answers on a **long bond paper**.
2. On the upper left of your bond paper, write your **full name** and your **course underneath**.
EX. JUAN DELA CRUZ JR.
BSME
3. On the upper center, write the **Module and Task Number**.
EX. MODULE #1- TASK 1
4. On the upper right, write the **date you have started** the exercises and **affix your signature right next to it**.
5. On the bottom center, write the **page number** (applicable to two or more pages only)



Sending Options

1. ONLINE	2. OFFLINE
• Take a photo of your output. Photos must be clear and in JPEG or PDF format. • Submit one file only. If with multiple pages/photos, organize your output into a single file with the file name: <i>Format: Module_FamilyName_DateOfSubmission</i> <i>Sample: M1_DelaCruz_08192021</i> • Review before submitting. Make sure that all pages/photos are incorporated in the file prior to sending. Submit your answers and solutions via moodle.	• Prepare the written solution/answer. If with multiple pages, organize your output using a binder or clips from page 1-n • Review before submitting. Make sure that the pages are complete. Place your output in a brown envelope with the ff details: <i>FROM: (Student's Name)</i> <i>(Address)</i> <i>(Contact Number)</i> <i>TO: Engr. Maria Noreene Costacorta</i> <i>College of Engineering, SLSU,</i> <i>Sogod, Southern Leyte</i> <i>Math 101 Basic Calculus</i>