

THE USE OF IPAD FOR CALCULUS CLASS IN HIGHER EDUCATION: NOTABILITY APPLICATION

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INTRODUCTION



INTRODUCTION



OBJECTIVES

THE OBJECTIVES OF THIS STUDY ARE:

1. To explain the design and development of e-materials using Notability on iPad in calculus class at tertiary level.
2. To present both its advantages and disadvantages of classroom-based teaching and learning
3. To focus on teaching calculus in order to demonstrate that using Notability on the iPad is a better option for teachers



NOTABILITY APP

Type or
write notes

Support
Apple Pencil

Annotate
on PDF

Integrated
cloud storages

Record
audio while
note-taking

Also available for iPhone
and Mac

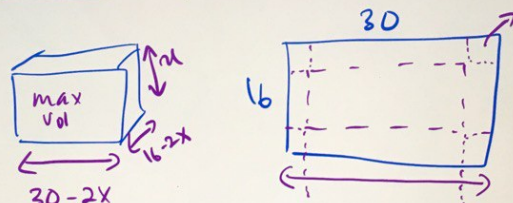


EMPLOYING NOTABILITY IN CALCULUS CLASS

The setup

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2. An open box is to be made from a 16 cm by 30 cm piece of cardboard by cutting out squares of equal size from the corners and bending up the sides. What size squares



$$\begin{aligned}
 Vol &= (30-2x)(16-2x)(x) \\
 &= (30-2x)(16x-2x^2) \\
 &= 480x - 60x^2 - 32x^2 + 4x^3 \\
 &= 480x - 92x^2 + 4x^3
 \end{aligned}$$

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Notability as whiteboard

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2.1 DEFINITION OF DIFFERENTIATION

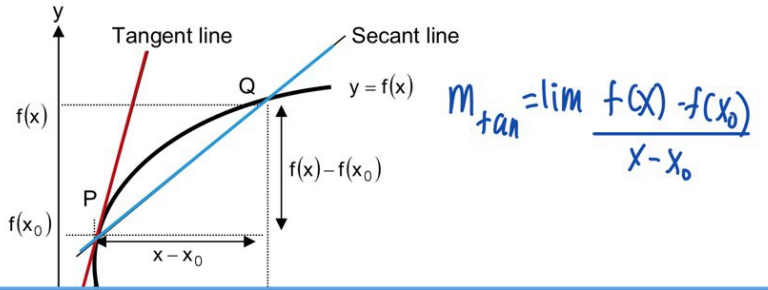
At the end of this chapter, students should be able to:

- State and apply the definition of differentiation, understand its relationship to the tangent line.

An Introduction to the Derivative: Tangents

In this section we will introduce the concept of a derivative, which is the primary mathematical tool that is used to calculate **rates of change** and **slope of tangent lines**.

Definition 1



$m_{tan} = \lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0}$

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Marking students' assessments

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ASSIGNMENT 1 :
Solve the following differentiations: **10/10**

(1) $\frac{d}{dx} (2x+5)^3$ (2) $\frac{d}{dx} (2x^2 - 3x + 1)^{-1}$ (3) $\frac{d}{ds} (2s^2 + 3)^{-\frac{1}{2}}$

Solution:

(1) $\frac{d}{dx} (2x+5)^3 = 3(2x+5)^2 \cdot \frac{d}{dx} (2x+5) = 3(2x+5)^2 \cdot 2 = 6(2x+5)^2$

(2) $\frac{d}{dx} (2x^2 - 3x + 1)^{-1} = -1(2x^2 - 3x + 1)^{-2} \cdot \frac{d}{dx} (2x^2 - 3x + 1)$
 $= -1(2x^2 - 3x + 1)^{-2} \cdot (4x - 3) = \frac{-4x + 3}{(2x^2 - 3x + 1)^2}$

(3) $\frac{d}{ds} (2s^2 + 3)^{-\frac{1}{2}} = -\frac{1}{2} (2s^2 + 3)^{-\frac{3}{2}} \cdot \frac{d}{ds} (2s^2 + 3) = -\frac{2s}{(\sqrt{2s^2 + 3})^3}$

ADVANTAGES

- Portable
- Replace whiteboard
- User friendly
- Auto backup
- Can be saved in PDF or image files

DISADVANTAGES

- iPad is not cheap
- Apple Pencil is sold separately
- Notability app can be purchased at USD9.99
- Extra accessories are need for projector's connection

CONCLUSION

- Teaching calculus requires flexibility
- Writing mathematical equations by hand-writing is easier than typing on keyboard
- Notability allows lessons to be carried out effortlessly and efficiently