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FACULTY OF SCIENCE

DEPARTMENT OF APPLIED PHYSICS AND ENGINEERING MATHEMATICS

NATIONAL DIPLOMA: ANALYTICAL CHEMISTRY
DIPLOMA IN ANALYTICAL CHEMISTRY (4 YEARS)

MODULE MAT2WA2/MAT1YE3
ENGINEERING MATHEMATICS 2A

CAMPUS DFC

JULY SUPPLEMENTARY EXAMINATION

DATE 20/07/2018

SESSION 08:00 – 10:00

ASSESSOR

MR TE MOGOROSI

INTERNAL MODERATOR

MR IK LETLHAGE

DURATION 2 HOURS

MARKS 70

SURNAME AND INITIALS: _____

STUDENT NUMBER: _____

CONTACT NO: _____

NUMBER OF PAGES: 19

REQUIREMENTS : INFORMATION BOOKLET
: NON-PROGRAMMABLE SCIENTIFIC CALCULATOR

INSTRUCTIONS : ANSWER ALL THE QUESTIONS.
: ENSURE THAT YOUR PAPER HAS ALL THE PRINTED PAGES.
: USE THE BLANK PAGES AT THE BACK TO DO ROUGH WORK AND INDICATE IT AS SUCH.
: NO PAGES SHOULD BE REMOVED FROM THIS PAPER.
: IF YOU RUN OUT OF SPACE FOR WRITING, USE THE BACK OF THE PREVIOUS PAGE TO COMPLETE YOUR ANSWER. NUMBER YOUR ANSWER CORRECTLY.
: USE ONLY BLUE OR BLACK INK TO WRITE. NO PENCIL

QUESTION 1

[14]

Determine the indicated derivative. Write the answer in its simplest form or, where applicable, give the answer correct to two decimal places.

1.1 $f'(x)$ if $f(x) = \frac{x}{\sqrt{1-4x^2}}$ (3)

[illegible]

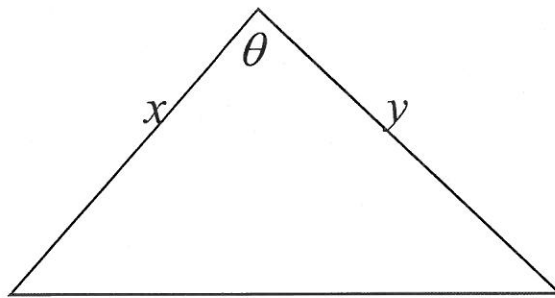
QUESTION 3

[5]

Use logarithmic differentiation to find $\frac{dy}{dx}$ if $y = \frac{e^{x^2} \cos e^x}{\sqrt{\sin^{-1} x}}$. Write the answer in its simplest form.

[illegible]

- 5.2 A surveyor wants to calculate the area of a triangular field. She measures two adjacent sides and finds that the one side has length $x = 50m$ and the other side has length $y = 75m$. Each of these measurements has a possible error of $0.2m$. She measures the angle between the two sides and finds that it is $\theta = 30^\circ$, with a possible error of 0.23° . Find the maximum error in the calculation of the area, A , of the field. The area is given by $A = \frac{1}{2}xy \sin \theta$. (5)



$$6.3 \int_0^{\frac{\pi}{6}} \sqrt{1 + \cos 2\theta} d\theta \quad (4)$$

$$6.4 \int 3^{\log_3 \frac{x^2}{\sqrt{x^6-1}}} dx \quad (3)$$

