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EM	
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FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS

**MODULE:WEA22C MATHEMATICS II
(NATIONAL DIPLOMA, ENGINEERING: CIVIL**

**CAMPUS: DFC
SUPPLEMENTARY EXAM: NOVEMBER 2014**

DATE 10 November 2014

SESSION 09:00

ASSESSORS

MR J BRUYNS

INTERNAL MODERATOR

MR C LOCK

DURATION 2 HOURS

MARKS 50

SURNAME AND INITIALS: _____

STUDENT NUMBER: _____

COURSE: _____

LECTURER: _____

CONTACT NO: _____

NUMBER OF PAGES: 10 (VERIFY CORRECT NUMBER OF PAGES IN YOUR SCRIPT))

INSTRUCTIONS : ANSWER ALL THE QUESTIONS

USE THE BLANK PAGES AT THE BACK TO DO ROUGH WORK

NO PAGES SHOULD BE REMOVED FROM THIS PAPER.

USE ONLY BLUE OR BLACK INK TO WRITE. NO PENCIL.

REQUIREMENTS : INFORMATION BOOKLET

: NON-PROGRAMMABLE SCIENTIFIC CALCULATOR

SHOW ALL THE STEPS TAKEN AND GIVE YOUR FINAL ANSWERS CORRECT TO TWO DECIMAL PLACES, WHERE APPLICABLE. USE THE BLANK PAGES FOR ROUGH WORK. ANYTHING WRITTEN IN PENCIL WILL NOT BE MARKED.

Evaluate the following integrals. Show all the integration steps.

[illegible]

[illegible]

(5)

[illegible]

(3)

[illegible]

(5)

[illegible]

(5)

[illegible]

1.7 $\int e^x \sin 2x dx$

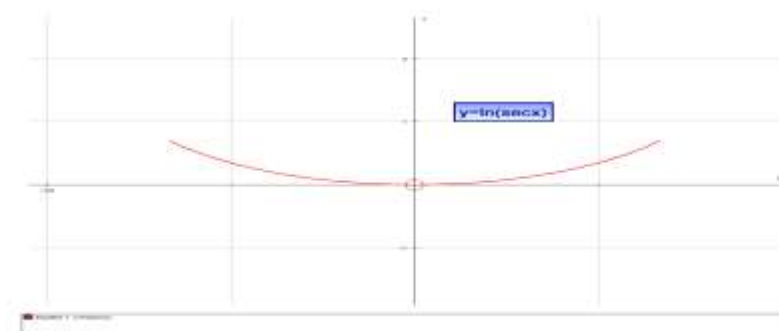
(5)

1.8 $\int \sin^5 2x \cos^3 2x dx$

(4)

1.9 The arc length of a curve is defined by $\int_a^b \sqrt{1 + \left(\frac{dy}{dx}\right)^2} dx$ (4)

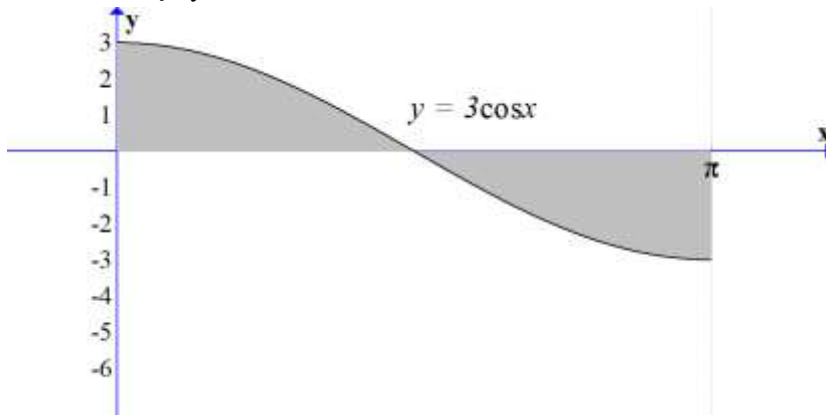
Calculate the length of the arc of $y = \ln|\sec x|$ between $-\frac{\pi}{3} \leq x \leq \frac{\pi}{3}$



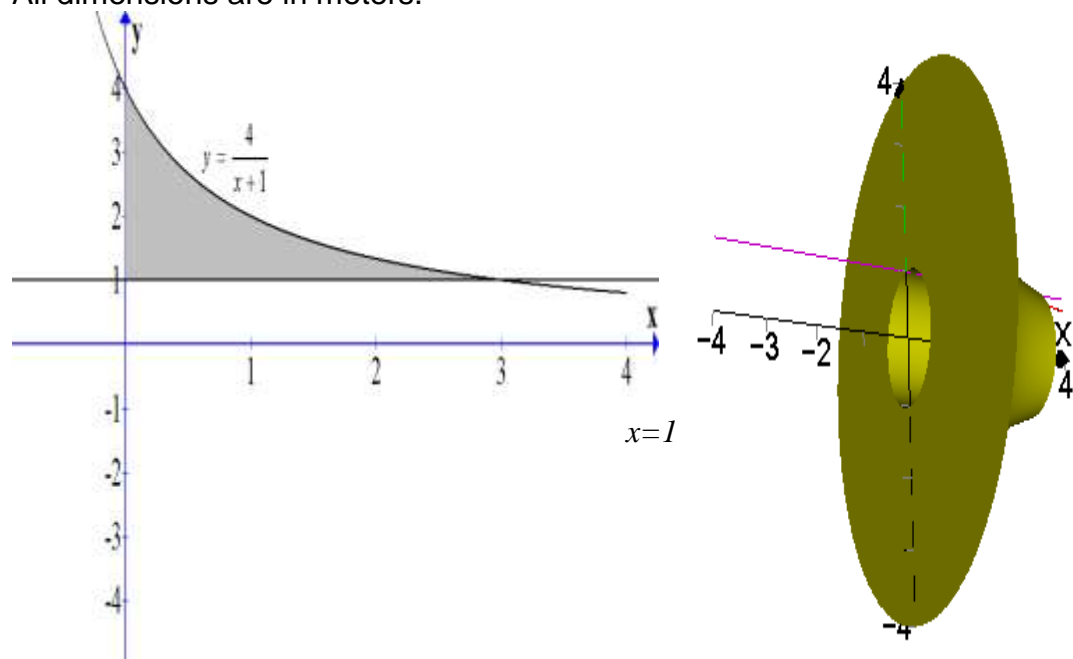
QUESTION 2

2.1.1 Calculate the shaded area bounded between $y = 3\cos x$ and the x axis. (3)

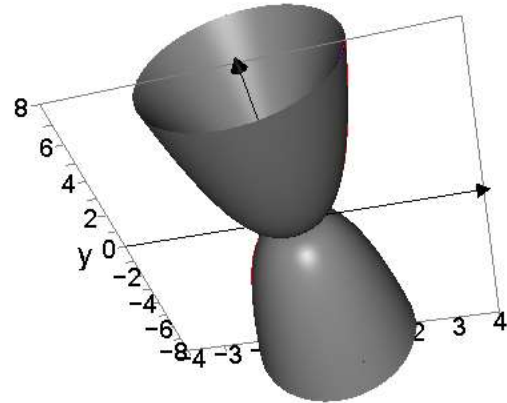
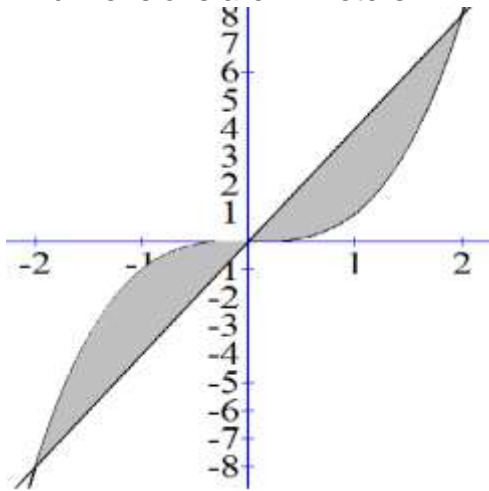
2.1.2 Calculate the volume of the solid of revolution generated when the area bounded by $y = 3\cos x$ is revolved about the x-axis. All dimensions are in meters.(5)

[illegible]

2.2 Calculate the volume when the shaded area is revolved about the the x-axis
All dimensions are in meters. (5)

[illegible]

2.3 Find the volume when the area bounded by $y = x^3$, $y = 4x$ rotates about the y -axis. All dimensions are in meters. (5)

[illegible]