



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

LOCATION: SWANSEA

LLEOLIAD: ABERTAWE

LEVEL 4

LEFEL 4

EXAMINATION PERIOD
JULY 2022

MODULE CODE: ACHA4006
FURTHER MATHEMATICS EXAM RESIT
TIME: 1 ½ HOURS
(PLUS HALF AN HOUR TO SUBMIT SOLUTIONS – 2 HOURS IN TOTAL)

ANSWER ALL QUESTIONS

Equipment or materials required –

Calculators allowed

Formula booklet provided

SHOW ALL WORKINGS

IMPORTANT INSTRUCTIONS FOR ONLINE EXAMINATIONS:

- ***You will need to submit a digital photograph or scan of each page of workings***
- ***Please submit these to Moodle (underneath where you accessed the exam paper)***
- ***Put the time, date, module code and your student number at the top of each page***
- ***Number each page ‘x of y’***
- ***If you have any issues, email richard.sutton@uwtsd.ac.uk with a contact number and they will call you with advice***

QUESTION ONE

Differentiate the following functions:

(i) $y = 6x^3 + 2x^2 + 7x - 10$

(ii) $y = (x + 7)(x - 2)$

(iii) $y = \frac{1}{x^9} - \sin 3x$

(iv) $y = e^{7x} \sin 5x$

(v) $y = \frac{x^2}{\cos x}$

(vi) $y = \sqrt{8x^4 + x + 7}$

(20 marks)

QUESTION TWO

Solve the following trigonometric equations for $0^\circ \leq x \leq 360^\circ$:

(i) $\sin x = 0.87$

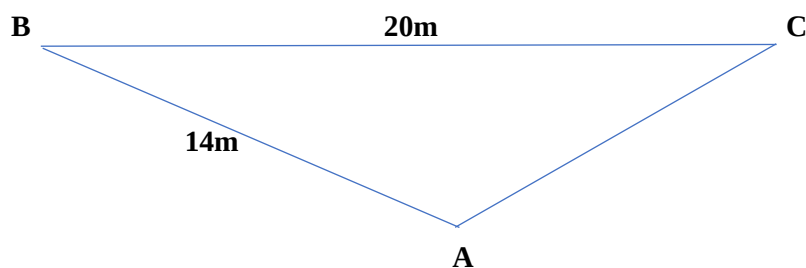
(ii) $4 \tan x = -9$

(iii) $7 \cos x = 2$

(9 marks)

QUESTION THREE

If the angle at A is 102° , find (i) Angle C, (ii) Angle B and (iii) length AC.



(6 marks)

QUESTION FOUR

Transpose the following formula to get p as the subject:

$$u = \frac{r(p^3 - T)}{z}$$

(4 marks)

QUESTION FIVE

Solve the following equations for x :

- (i) $2^{x+3} = 4^x$
- (ii) $\log(x + 4) + \log(x + 1) = \log(x + 9) + \log(x + 2)$

(10 marks)

QUESTION SIX

Integrate the following:

- (i) $\int x^5 + 3x^2 + 4x - 5 \, dx$
- (ii) $\int x^5(x^2 + x + 7) \, dx$
- (iii) $\int 7 \cos 2x \, dx$
- (iv) $\int_0^2 (x + 3)(x + 2) \, dx$

(18 marks)

TOTAL MARKS: 67