

LOCATION: SWANSEA

LLEOLIAD: ABERTAWE

LEVEL 3

LEFEL 3

MODULE CODE: ACHA3000
INTRODUCTION TO MATHEMATICS AND SCIENCE (TEST 1 MAY 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*

1. Simplify the following:

(i) $x^2 \times x^7 \times x$

(ii) $5x^2 \times x^2 \times 3x$

(iii) $\frac{x^9 \times x^5 \times x^2}{x^3}$

(iv) $(3x^2)^3$

(v) $\sqrt{x} \times x$

(7 marks)

2. Solve the following linear equations for x :

(i) $12x - 10 = 8x + 15$

(ii) $3(8x - 2) = 2(2x + 1)$

(iii) $\frac{8x+1}{2} = \frac{5x+1}{3}$

(12 marks)

3. Solve the following quadratic equations by using the factorisation method:

(i) $x^2 + 10x + 25 = 0$

(ii) $x^2 + 7x + 6 = 0$

(iii) $x^2 + 18x + 80 = 0$

(iv) $x^2 - 100 = 0$

(v) $2x^2 + 3x + 1 = 0$

(16 marks)

4. Use the formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ to find the two solutions of the following quadratic equation, **giving your answers correct to two decimal places.**

$$12x^2 + x - 15 = 0$$

(7 marks)

5. Solve the following simultaneous equations:

$$2x + 3y = 13$$

$$4x + 2y = 22$$

(5 marks)

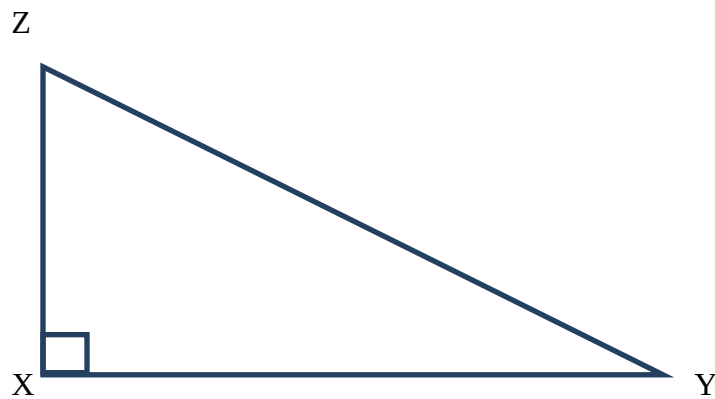
6.

In the following right-angled triangle, if XZ is 6 metres and XY is 10 metres, calculate:

(i) Angle Y

(ii) Angle Z

(iii) Length YZ using Pythagoras' theorem



(6 marks)

7. Express the following as x to a power:

(i) $\sqrt[5]{x}$

(ii) 1

(2 marks)

TOTAL MARKS: 55