UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: **BSc. in Agricultural Economics and Agribusiness Management Year I**
BSc. in Agricultural Education Year I
BSc. in Agronomy Year I
BSc. in Animal Science Year I
BSc. in Food Science, Nutrition and Technology Year I
BSc. in consumer science Year I
BSc. in Consumer science education Year I
BSc. in Horticulture Year I
BSc. in Agricultural & bios stems Engineering Year I
BSc. in Textiles Apparel Design and Management Year I

COURSE CODE: **AEM 101**

TITLE OF PAPER: MATHEMATICS

TIME ALLOWED: 2:00 HOURS

INSTRUCTION: 1. ANSWER ALL QUESTIONS

2.ALL QUESTIONS CARRIES 25 MARKS.

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Question 1

1.1 If a line 920 cm long is divided into four parts in the ratio 15:13:10:8 the what is the length of the longest? **(6 MARKS)**

1.2 When a shopkeeper sells articles for E18.90 each he makes a profit of 26% on the Cost price. During a sale the articles are marked at E15.60 each. Calculate the percentage profit on an article sold during the sale. **(7 MARKS)**

1.3 Find the solution set of $(¾)^x = 64/27$? **(6 MARKS)**

1.4 Factorize $\frac{m^2}{4} + \frac{m}{3} + \frac{1}{9}$ **(6 MARKS)**

Question 2

2.1 A householder buys two daily papers at a cents each and 3 Sunday papers at b cents each. What is his yearly expenditure (Emalangeni) **(6 MARKS)**

2.2 Solve the equation

$$\frac{2x}{x+2} = \frac{3x}{x+5} - 1$$ **(6 MARKS)**

2.3 Find the solution set of

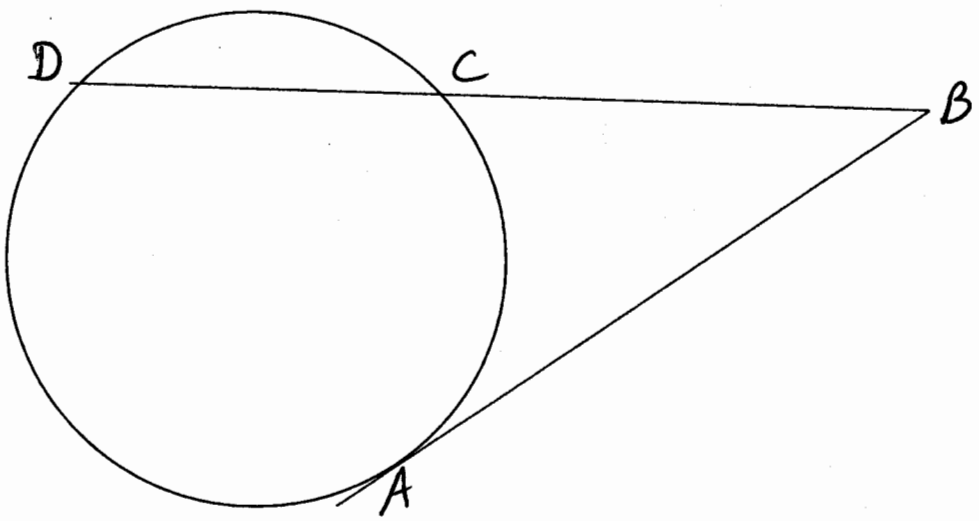
$\log_3^{(x+6)} - \log_3^{(x-2)} = 2$ **(6 MARKS)**

2.4. Using the equation for the decay of strontium 90 , $q = q_o\ e^{-0.12t}$

How many years will it take until only one-half of the original amount of the substance is left? **(7 MARKS)**

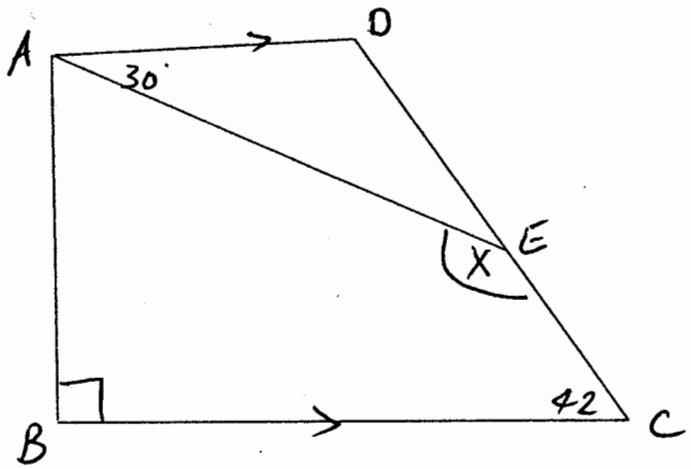
Question 3

3.1In the figure below, CD = 3 cm BC= 2 cm . Calculate the lengths of the tangent AB **(6 MARKS)**



3.2 Find the value of k(other than 0) for which$(3p-q)^2 + kpq$ is a perfect square? **(6 MARKS)**

3.3 Calculate the angle x in the following figure? **(6 MARKS)**



3.4 Given that $y = -x^2 + 3x - 6$, calculate

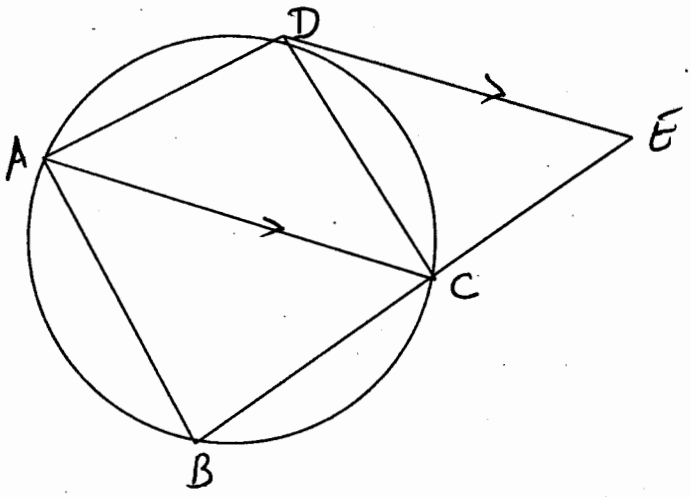
3.31 the gradient of the tangent to the curve of y at the point Where x = -2.

3.33 The value of x for which y has its maximum value. **(6 MARKS)**

3.5 In the following fig. AC is parallel to the tangent DE. Prove that

3.41. Δ ADC is isosceles;

3.42 < ABC = 2 < DAC **(7 MARKS)**



Question 4

4.1 A farmer uses 100m of hurdles to make a rectangular cattle pen. If he makes a pen of length x metres show that the area enclosed is $(50x - x^2)$ square .
Find the value of x so that the area shall be maximum? **(6 MARKS)**

4.2 .Evaluate the following definite integral; **(6 MARKS)**

$$\int_2^5 x^3 + 4x - 2dx$$

4.2. Evaluate sin A cos B – sin B cos A given that sin A = 3/5 and tan B = 4/3. a and b are both acute angles. **(6 MARKS)**

4.3. To find the height of a tower a surveyor stands some distance from its base and finds the angle of elevation to the top of the tower is 60^0.He moves 250 m nearer to the base and finds the angle of elevation is now 750^0.if the ground is horizontal, then what will be the height of tower ? **(7 MARKS)**

END OF PAPER