



1<sup>st</sup> SEM. 2007/2008

page 1 of 3

**UNIVERSITY OF SWAZILAND**

**FINAL 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 Home Economics Year I  
BSc. in Home Economics Education Year I  
BSc. in Horticulture Year I  
BSc. in Land and Water Management 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 20 MARKS.

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THE CHIEF INVIGILATOR**

**Question 1**

- a. A, B and C share a some of money in the ratio of 5:8:12. If C receives E 12 more than B, find the sum of money that was shared.
- b. How long will it take the earth's population to double if it continuous to grow at the rate of 2 percent per year compounded continuously?
- c. Find the solution set of the equation

$$\frac{2}{x+1} - \frac{1}{2x-1} = \frac{1}{x}$$

**Question 2**

- a.. Find the solution set of each logarithmic equation.

i)  $\log_{10}^{(3x+2)} + \log_{10}^2 = 2$

ii)  $\log_{10}^{(x+21)} + \log_{10}^x = 3$

- b. ABCD is a trapezium in which AB is parallel to DC.

AB = 3 cm, DC = 6 cm and the diagonal BD = 7.8 cm. If BD and AC meet at K, calculate KB. If X is the midpoint of BD & parallel to DC through X meets AC at Y, calculate XY.

**Question 3**

Given that  $y = 60x + 3x^2 - 4x^3$ , calculate

- i) the gradient of the tangent to the curve of y at the point where  $x=1$ .
- ii) the value of x for which y has its maximum value;
- iii) the value of x for which y has its minimum value.

**Question 4**

a. Evaluate the following definite integral;

$$\int (3x^2 - 4x + 3) dx$$

b. Find the areas between the curves  $y=x^3$ , the x-axis and the lines  $X= 5$  and  $x= 3$ .

**Question 5**

a. Find the inverse of the matrix  $\begin{pmatrix} -1 & 2 \\ -3 & 1 \end{pmatrix}$

b. The mean of n numbers is 20. If the same numbers together with 30 have a mean of 22 find n?