

1st SEM. 2012



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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 consumer science Year I
BSc. in Consumer sciences 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: ANSWER ALL QUESTIONS

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CHIEF INVIGILATOR**

Question I, choose the correct answer. (4 points each)

1.1. The solution of the simultaneous equations $\begin{cases} 3x - 2y = 5 \\ 4x - y = 10 \end{cases}$ is

- a. (-3,22)
- b. (-3,-22)
- c. (3,3)
- d. (3, 2)

1.2. The complete factorized form of $x^8 - y^8$ is

- a. $(x^4 + y^4) \cdot (x^4 - y^4)$
- b. $(x^4 + y^4) \cdot (x^2 + y^2)(x + y)$
- c. $(x^4 - y^4) \cdot (x^2 + y^2)(x+y)(x-y)$
- d. $(x^4 + y^4) \cdot (x^2 + y^2)(x+y)(x-y)$

1.3. If $A(x-1) + B(x+1) = 3x + 5$ for all values of x then the values of A and B are

- a. A= 2 , B = -2
- b. A= 1 , B = 4
- c. A= -1 , B = 4
- d. A= 1 , B = -1

1.4. $\sqrt{9p^4} \div \frac{1}{2}p^2$ is equal to

- a. $6p^4$
- b. 3
- c. 6
- d. $3p^4$

1.5. If $\log y = -2$ then y is equal to

- a. -100
- b. 0.01
- c. 0.1
- d. -0.01

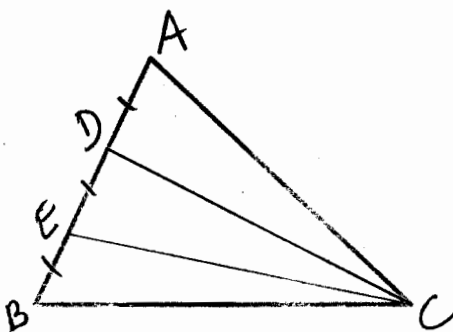
1.6. If $y = \frac{3x^3 - 2x^2}{x}$, then $\frac{dy}{dx}$ is equal to

- a. $6x - 2$
- b. $9x^2 - 4x + \frac{1}{x^2}$
- c. $9x^2 - 4x - \frac{1}{x^2}$
- d. $2 - 6x$

1.7 A regular polygon has each interior angle greater by 60° than each exterior angle. It therefore has

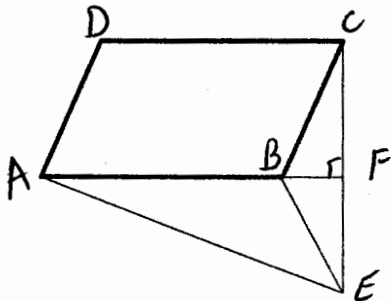
- a. 6 sides
- b. 4 sides
- c. 7 sides
- d. 8 sides

1.8.. Which of the following is not true in fig below if $AD = DE = EB$.



- a. Δs ADC and CED are equal in area.
- b. ΔBCD has twice the area of ΔADC
- c. ΔABC has three times the area of ΔACD
- d. none of the above.

1.9. In the fig below ABCD is a parallelogram and CF = EF, hence

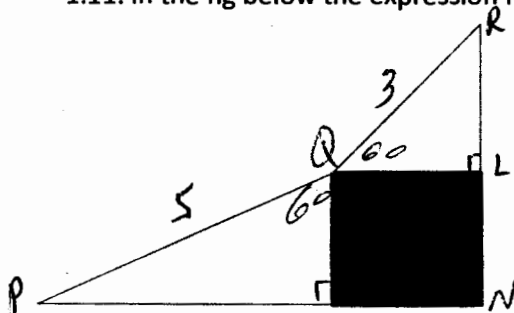


- a. $BC = BE = AB$
- b. $AD = AE$
- c. $\text{area } ABCD = \text{area } AFE$
- d. $\text{area } ABCD = 2 \times \text{area } ABE$

1.10. A regular five sided figure is inscribed in a circle .The angle subtended at the circumference by the figure is

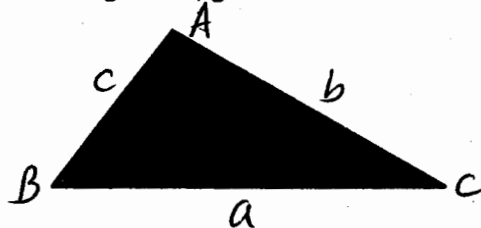
- a. 72°
- b. 36°
- c. 54°
- d. 108°

1.11. In the fig below the expression for the side RN is



- a. $5 \cos 30 + 3 \sin 60$
- b. $5 \sin 30 + 3 \cos 60$
- c. $5 \cos 30 + 3 \cos 60$
- d. $5 \sin 30 + 3 \sin 60$

1.12 .In the fig below, given $\angle B$ and sides a & c the side b is given by the expressions.



- a. $b = \frac{\sin A}{a \sin B}$
- b. $b^2 = a^2 + c^2 + 2ac \cos B$
- c. $b = \frac{a \sin B}{\sin A}$
- d. $b^2 = a^2 + c^2 - 2ac \cos B$

1.13 A man standing on top of a cliff 80 m high is in line with buoys whose angle of depression are 15° and 20° . The distance between the buoys is given by the expression

- a. $80(\tan 20^\circ - \tan 15^\circ)$
- b. $\frac{80}{\tan 20^\circ - \tan 15^\circ}$
- c. $80 \tan 5^\circ$
- d. $80(\tan 75^\circ - \tan 70^\circ)$

1.14. Which of the following is not measures of a side of a right angled triangle?

- a. 3,4,5
- b. 5,12,13.
- c. 6,8,10
- d. 5,7,9

1.15. If $\cos A = 12/13$ then $\sin A$ is

- a. 1
- b. $13/12$
- c. $5/12$
- d. $5/13$

Question 2

2.1. Find the area between the straight line $y = 12 + 3x$ and the curve $y = 2x^2 + 3$ (5 points)

2.3 Find the solution set of system of simultaneous equation. (5 points)

$$\begin{aligned}x^2 + y^2 &= 34 \\ xy &= 13\end{aligned}$$

Question 3

3.1. Find the solution of exponential equation (5 points)

$$(2)^x = 64$$

3.2. Find the solution set of logarithmic equation. (5 points)

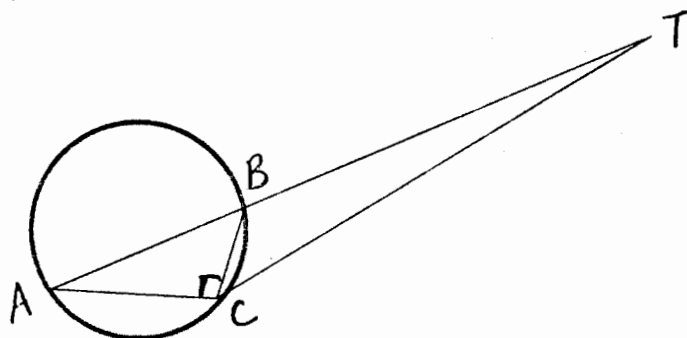
$$\log_2^{(x-1)} = 2 \log_2^x$$

Question 4

4.1 Evaluate $\int_0^2 (x^2+2) dx$

(5 points)

4.2 The tangent at point C on a circle meets the diameter AB produced at T. If $\angle BCT = 27^\circ$, Calculate $\angle CTA$. If $CT = t$ and $BT = x$, Prove that the radius of the circle is $\frac{t^2-x^2}{2x}$



(5 points)

END OF PAPER