



FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND APPLIED MATHEMATICS

MODULE: MATHEMATICS FOR FINANCE AND BUSINESS 1A– MATDCA1

CAMPUS: SWC & APK

ASSESSMENT: SUPPLEMENTARY EXAM

DATE: JULY 2019

ASSESSORS: MS M JUGA
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INTERNAL MODERATOR: DR J MBA

DURATION: 2 HOURS

68

INITIALS AND SURNAME: _____

STUDENT NUMBER: _____

CONTACT NUMBER: _____

NUMBER OF PAGES: 10 (INCLUDING COVER PAGE)

INSTRUCTIONS:

- ANSWER ALL THE QUESTIONS IN PEN.
- ALL GRAPHS MUST BE DRAWN IN PEN.
- NO PENCIL OR TIPEX ALLOWED.
- SHOW ALL THE NECESSARY CALCULATIONS CLEARLY.
- IF FORMULAS ARE USED THEY MUST BE STATED AS MARKS ARE GIVEN TO THEM.
- ONLY SCIENTIFIC CALCULATORS ARE ALLOWED.
- IF NECESSARY, ROUND OFF TO TWO DECIMAL PLACES.
- THE QUESTIONS CAN BE ANSWERED IN ANY ORDER.

Question 1**[13]**

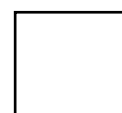
Simplify the following expressions

1.1 $(3x + 1)^2 - 4(x + 1)(2x - 5)$ [3]

1.2 $\frac{3x^2 - x}{x - 1} - \frac{3x}{x + 2}$ [2]

1.3 $\left(\frac{4x^4 \cdot x^3}{2x^{-2}}\right)^2$ [3]

1.4 $\ln(x) + \ln(x^3) + 1$ [2]



1.5 $\frac{x^2-3x}{x+1} \div \frac{x}{x^2+3x+2}$ [3]

Question 2 [4]

Rationalize the denominator in the following fractions:

2.1 $\frac{x}{5-\sqrt{2x}}$ [2]

2.2 $\frac{4x}{\sqrt[5]{x \cdot y^7}}$ [2]

Question 3 [12]

Solve for x in the following equations:

3.1 $\frac{2x-1}{2x^2+3x-2} = \frac{x}{x+3}$ [3]

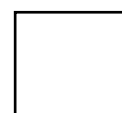


3.2 $5(x + 1) = \frac{1}{2}(x + 4) + 8x - 2$ [2]

3.3 $\log_5(x + 3) = \log_5(4x + 5)$ [2]

3.4 $10e^{3x-7} = 5$ [3]

3.5 $4x^2 - 24 = 0$ [2]



Question 4**[5]**

Simplify the following operation by making use of long division:

$$(x^4 + 3x^2) \div (x + 4)$$

Question 5**[9]**

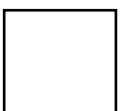
Given the function, $f(x) = 3^{x-1} - 4$, determine the following:

5.1 The y intercept(s). [1]

5.2 State the domain and range of $f(x)$. [2]

5.3 Complete the following table for the function: [3]

x	-1	0	1	2	3	4
y						

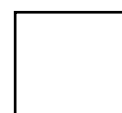


5.4 Sketch the graph of $f(x)$. [3]

Question 6 [4]

6.1 Sketch $g(x) = -5x$ indicating all intercepts. [2]

6.2 Find the equation of the straight line that passes through the points: $(1; 4)$ and $(-5; 9)$. [2]



Question 7**[4]**

Factorise the following expressions completely:

7.1 $2x^4 - 16$ [2]

7.2 $64a^3 + 8$ [2]

Question 8**[4]**

8.1 Convert the following into logarithmic form:

8.1.1 $3^2 = 6x$ [1]

8.1.2 $121 = 11^2$ [1]

8.2 Convert the following to an equivalent exponential form:

8.2.1 $\log_x m = n$ [1]

8.2.2 $\log_7 a = x$ [1]



Question 9**[5]**

Solve the following systems

$$9.1 \quad \begin{cases} 2x - 2y = 4 \\ y = -9x + 12 \end{cases} \quad [3]$$

$$9.2 \quad \begin{cases} y = x \\ x + y = 0 \end{cases} \quad [2]$$

Question 10**[5]**

A local building supply store find that the demand function for their concrete mixer is:

$$p = 2,000 - 25q$$

$$10.1 \quad \text{Determine a revenue function for the product.} \quad [1]$$



10.2 Determine the maximum revenue they can expect for the product. [2]

10.3 If the demand for the concrete mixer is 50 units, determine the price. [2]

Question 11

[3]

Surefire LLC finds that their assets total $R\ 100\ 200.00$ and their liabilities $R\ 67\ 500.00$. They decide to take out a loan to buy an additional delivery vehicle whilst maintaining a current ratio of more than $CR = 3.2$. Determine the maximum amount they can borrow.

End of Assessment – Total 68 Marks



Use this space if you want to redo a question. Clearly indicate at the question that the answer is on Page 10.

