

FINAL SEMESTER EXAMINATION

Student NRIC : _____
Student ID : _____

Programme	:	FOUNDATION OF ART (MQA/13891)
Intake	:	SEPT 2021 (YEAR 1 SEMESTER 1)
Course	:	MATHEMATICS
Course Code	:	FA1134
Duration	:	3 hours

INSTRUCTIONS TO CANDIDATES:

1. Please read the instructions given in the question paper **CAREFULLY**.
2. This question paper consists of **FOUR (4)** questions
3. Answer **ALL** questions in the question paper.
4. Answers to the questions are to be written into the examination booklet.
5. Electronic dictionaries, lecture notes, files or any unauthorised materials except writing equipment are strictly prohibited.

This question paper must be submitted along with all used and/or unused rough papers and/ or graph papers (if any). Candidates are **NOT ALLOWED** to take any examination paper(s) used or unused out of the examination hall.

WARNING:

The Examination Board of Peninsula College Georgetown regards cheating as a very serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in the accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from Peninsula College Georgetown.

(This booklet contains 6 printed pages including this page)

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ALLOWED TO DO SO

For examiner's use only

QUESTION NO.	MARKS
1	/ 25
2	/ 25
3	/ 25
4	/ 25
Total	/ 100

Answer **ALL** questions on the separate sheet provided.

[100 marks]

1. a) Solve the following simultaneous equations by using the matrix method.

$$2x = 5 - 3y$$

$$7x = 1 - 5y$$

(10 marks)

- b) A hawker sells laksa and curry mee. The number of bowls of food sold during a particular day are shown in the table below. The income received from the sale of laksa and curly mee on that day was RM291.00 and RM130.00 respectively. If the cost of a small bowl of either food is RM x and the cost of large bowl of either food is RM y , find the values of x and y .

FOOD	SMALL BOWL	LARGE BOWL
LAKSA	42	36
CURRY MEE	20	15

(15 marks)

Total: [25 marks]

2. a) Given that $y = (2x^2 - 2)(x^2 + 3)$, find $\frac{dy}{dx}$

(6 marks)

- b) Find the gradient of the tangent to the curve $y = 2x^3 + 3x^2 - 7x - 5$ at the point $(-2, 5)$

(6 marks)

- c) Given $f(x) = \frac{2x^2+5}{2x-1}$, find $f'(x)$

(7 marks)

- d) Given that $y = 2(3x - 5)^4$, find $\frac{dy}{dx}$

(6 marks)

Total: [25 marks]

3. a) Find the indefinite integral for each of the following.

i) $\int \frac{(x+3x^2)}{x^4} dx$

(5 marks)

ii) $\int x^2 \left(3 - \frac{4}{x^4}\right) dx$

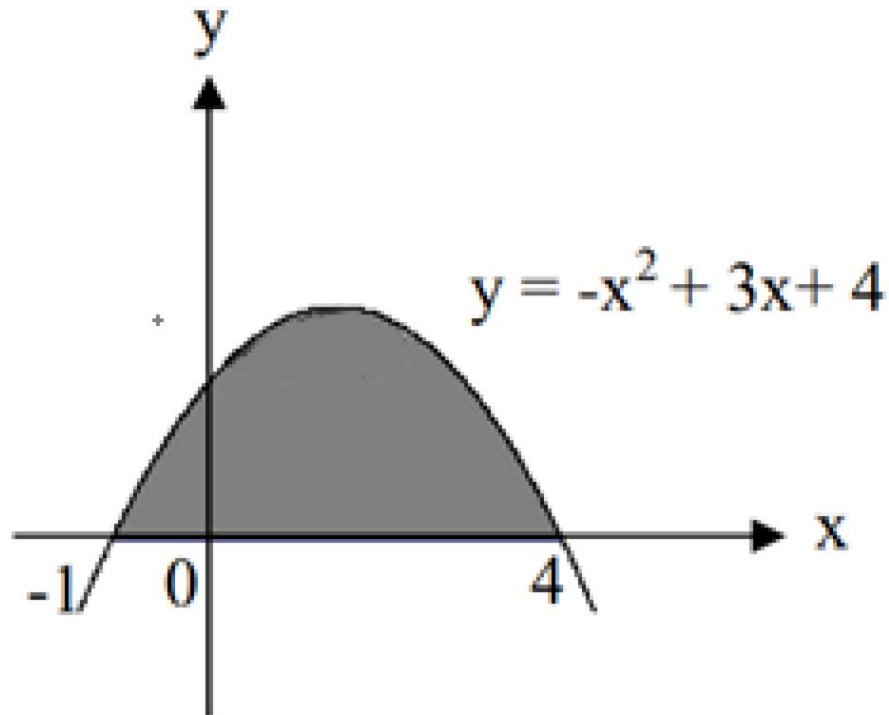
(5 marks)

b) Find the indefinite integral for each of the following using substitution method.

i) $\int 4(3x + 5)^7$ (5 marks)

ii) $\int \frac{2}{(5x+3)^3} dx$ (5 marks)

c) Find the area of the shaded region in the diagram.



(5 marks)
Total: [25 marks]

4. a) The following frequency distribution table shows the heights of 40 students in a class.

Height(cm)	140-149	150-159	160-169	170-179	180-189
Number of students	1	11	18	8	2

Calculate the mean height of the students. (5 marks)

- b) The following table shows the number of books published in a year by 30 publishers.

Number of books	50-99	100-149	150-199	200-249	250-299
Frequency	4	8	11	5	2

Find the variance of the number of books published.

(8 marks)

- c) Box C contains 4 black marbles and 6 yellow marbles. A marble is chosen at random from box C, its colour is noted and the marble is returned to the box. Then a second marble is chosen.

i) Draw a tree diagram. (3 marks)

ii) Determine the probability that both marbles are black. (3 marks)

iii) Determine the probability the two balls are of different colours. (3 marks)

iv) Determine the probability at least one of the balls chosen is yellow. (3 marks)

Total: [25 marks]

- END OF QUESTIONS -

List of Formula:

ALGEBRA

$$1 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$2 \quad a^m \times a^n = a^{m+n}$$

$$3 \quad a^m \div a^n = a^{m-n}$$

$$4 \quad (a^m)^n = a^{mn}$$

$$5 \quad \log_a mn = \log_a m + \log_a n$$

$$6 \quad \log_a \frac{m}{n} = \log_a m - \log_a n$$

$$7 \quad \log_a m^n = n \log_a m$$

$$8 \quad \log_a b = \frac{\log_c b}{\log_c a}$$

$$9 \quad T_n = a + (n-1)d$$

$$10 \quad S_n = \frac{n}{2}[2a + (n-1)d]$$

$$11 \quad T_n = ar^{n-1}$$

$$12 \quad S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}, r \neq 1$$

$$13 \quad S_\infty = \frac{a}{1-r}, |r| < 1$$

CALCULUS (KALKULUS)

$$1 \quad y = uv, \quad \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

$$2 \quad y = \frac{u}{v}, \quad \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

$$3 \quad \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

$$4 \quad \text{Area under a curve} \\ (\text{Luas di bawah lengkung}) \\ = \int_a^b y \, dx \quad \text{or (atau)} \\ = \int_a^b x \, dy$$

$$5 \quad \text{Volume generated (Isipadu janaan)} \\ = \int_a^b \pi y^2 \, dx \quad \text{or (atau)} \\ = \int_a^b \pi x^2 \, dy$$

STATISTICS (STATISTIK)

$$1 \quad \bar{x} = \frac{\sum x}{N}$$

$$2 \quad \bar{x} = \frac{\sum fx}{\sum f}$$

$$3 \quad \sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$$

$$4 \quad \sigma = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$$

$$5 \quad m = L + \left(\frac{\frac{1}{2}N - F}{f_m} \right) C$$

$$6 \quad I = \frac{Q_1}{Q_2} \times 100$$

$$7 \quad \bar{I} = \frac{\sum W_i I_i}{\sum W_i}$$

Additional formula:

$$\int a \, dx = ax + c, \text{ where } a \text{ and } c \text{ are constants.}$$

$$\int ax^n \, dx = \frac{ax^{n+1}}{n+1} + c, \text{ where } a \text{ and } c \text{ are constants, } n \text{ is an integer and } n \neq -1.$$

$$\int (ax + b)^n \, dx = \frac{(ax + b)^{n+1}}{a(n+1)} + c, \text{ where } a \text{ and } b \text{ are constants, } n \text{ is an integer and } n \neq -1.$$

$$A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$$

$$P(A) = \frac{n(A)}{n(S)}$$

$$P(A') = 1 - P(A)$$