



Initial Examination Paper

Faculty Name:	Humanities
Module Name:	Introduction to Mathematics
Module Code:	FPBM011/FPBM011/FPBM031
Date:	May/June 2019
Total Marks:	100
Duration:	3 Hours, 0 Minutes
Examiner:	Ms Wing Sze Vingin Leung
Second Examiner:	Mr Franco Hagoramagara
Copy Editor:	Mr David Oldert
Resources Required:	Non-programmable Calculator
Section A: Multiple Choice	30 Marks
Section B: Calculation Questions	70 Marks

This examination contributes 50% towards the final mark.

Instructions to Student

- Ensure that you are writing the correct examination.
- Read each question carefully.
- Answer all required questions in the answer book provided unless otherwise specified.
- All rough work should be done in the back of the answer book and indicated as such.
- This paper should not be removed from the assessment venue.
- Refer to the instructions in the examination answer book.

Section A

Multiple Choice Questions

30 Marks

On the multiple-choice question answer section provided in your answer book, make a cross (X) over your chosen answer option for each question. There is only one right answer.

Question 1

1.1 Find the product of $(3a - 2)^2$.

- a. $9a^2 - 12a + 4$
- b. $9a^2 - 6a + 4$
- c. $9a^2 + 4$
- d. $(3a - 2)(3a + 2)$

1.2 What is the degree for this following monomial? 3^4a^2bcd

- a. 5 degree
- b. 8 degree
- c. 9 degree
- d. 7 degree

1.3 Which two integers is $\sqrt{240}$ between?

- a. 15 and 16
- b. 13 and 14
- c. 16 and 17
- d. 14 and 15

1.4 Simplify the radical: $\sqrt[5]{486x^{15}y^{21}z^6}$.

- a. $3x^3y^4z\sqrt[5]{2yz}$
- b. $6\sqrt[5]{13x^{15}y^{21}z^6}$
- c. $3x^3y^4z\sqrt{2yz}$
- d. None of these

1.5 Which of the following is a factor of $a^2 + a - 12$?

- a. $(a + 3)$
- b. $(a - 1)$
- c. $(a - 4)$
- d. $(a - 3)$

1.6 How many term(s) are in this algebraic expression?

$$k^3y^2 - \frac{c^3x^4z}{2} - 7 + 5\sqrt{3t}$$

- a. Binomial
- b. Trinomial
- c. Multinomial
- d. Quadnomial

1.7 Find the lowest common multiply (LCM) of each of the group of polynomials.

$$48a^2b^4; 32a^3b^2$$

- a. $2 \times 3 \times a \times b$
- b. $2^5 \times 3 \times a^3 \times b^4$
- c. $2^5 \times 3 \times a \times b$
- d. $2 \times 3 \times a^3 \times b^4$

1.8 Which of the following is equal to $(2a^3b)^5$?

- a. $32a^{15}b^5$
- b. $10a^8b^6$
- c. $2a^8b^5$
- d. $32a^8b^6$

1.9 If $a - b = 10$ and $a = 6$, what is b ?

- a. 4
- b. -4
- c. unreal
- d. 16

1.10 Multiply: $-5x^5(10x^2 + 5)$.

- a. $-50x^7 + 5$
- b. $-50x^7 - 25x^5$
- c. $-75x^5$
- d. $-50x^2 - 25$

1.11 Mc Trump family restaurant in California currently has a staff of 6 200 employees. Next month, Mc Trump will decrease its staff by 8%. How many people will be employed by Mc Trump next month?

- a. 496 employees
- b. 6 192 employees
- c. 5 704 employees
- d. 77 500 employees

1.12 Which of the following is equivalent to $\frac{1}{(\sqrt[4]{a})^3}$?

- a. $a^{-\frac{4}{3}}$
- b. $a^{\frac{3}{4}}$
- c. $a^{-\frac{3}{4}}$
- d. $a^{\frac{4}{3}}$

1.13 A tutor hourly wage will increase from R24,00 to R27,60. What percent increase does this represent?

- a. 86,96%
- b. 3,6%
- c. 13,04%
- d. 15%

1.14 Simplify: $3x^{\frac{2}{3}} \times 2x^{\frac{1}{2}}$

- a. $6x^{\frac{3}{5}}$
- b. $6x$
- c. $6x^{\frac{1}{3}}$
- d. $6x^{\frac{7}{6}}$

1.15 What is the coefficient of xy^2 .

- a. 0
- b. xy
- c. 2
- d. 1

(15 × 2 Marks)

End of Section A

Section B

Calculation Questions

70 Marks

Question 2

In the expression $-3b^4 - 2b^2 - 8 - b^3 - 2b$:

- 2.1 The constant term is? (1 Mark)
- 2.2 How many terms are in the expression? (1 Mark)
- 2.3 The degree of the expression is? (1 Mark)
- 2.4 What is the coefficient of the b^3 term? (1 Mark)
- 2.5 What is the value of the expression, if $b = -1$? (2 Marks)

Question 3

Subtract the algebraic expressions below (*hint: collect and subtract like terms*): (4 Marks)

$$(-15a^2 + 6 - 20a) - (-13a - 5a^2 + 4) - (8a^2 - 10 - 2a)$$

Question 4

Expand or multiply the following algebraic expressions:

- 4.1 $(-g - 8)^2$ (3 Marks)
- 4.2 $(a - 3)(a - 4)(2a - 1)$ (5 Marks)

Question 5

Divide the following algebraic expression: (5 Marks)

$$\frac{2k^3 + 7k^2 + 2k + 9}{2k + 3}$$

Question 6

Match Column A with Column B by stating the question number and the letter e.g. 6.1 a.

Column A	Column B
6.1 $\frac{-12}{16}$; $-0,333$; $0.\overline{345}$; $9\frac{1}{4}$ and $\sqrt{25}$	a. Whole number
6.2 15; 9; 6; 3; 0	b. Unreal number
6.3 $\sqrt{-16}$; $\frac{x}{0}$	c. Irrational number
6.4 $\sqrt{216}$; π ; $\sqrt{27}$ and $\sqrt{125}$	d. Integers
6.5 4; 6; -8 ; 0	e. Odd number
6.6 4; 289; 49	f. Rational number
	g. Prime number
	h. Square number

(6 Marks)

Question 7

Write the conjugate for each binomial:

7.1.1 $\sqrt{3} - 2$

(1 Mark)

7.1.2 $4 + \sqrt{8}$

(1 Mark)

Rationalize the denominators in the following radicals without a calculator. Show all your working steps.

7.2.1 $\frac{-8}{2-\sqrt{5}}$

(4 Marks)

7.2.2 $\frac{-4}{\sqrt{3}-\sqrt{7}}$

(4 Marks)

Question 8

Factorise:

8.1 $7b+3b^2+4$

(3 Marks)

8.2 $a^4 - 1$

(4 Marks)

Question 9

Evaluate the following expressions:

9.1 $\left(\frac{4a^2b^3c^0}{16a^3b^4c^3}\right)^{-2}$ (4 Marks)

9.2 $\frac{4x^2 \cdot 2x^3 \times x^5 \times x^3}{-(9x^2y^3)^0}$ (4 Marks)

Question 10

10.1 Convert decimal number to percentage

10.1.1 0,001 (1 Mark)

10.1.2 1,28 (1 Mark)

10.2 The original price of a car was R777 000. It was decreased to R630 000. What is the percent decrease of the price of the car? (Round off to 4 decimal places) (2 Marks)

10.3 If a salesman earns a 17,5% on all orders. How much commission does the salesman earn on a R9000 order? (2 Marks)

Question 11

Match Column A with Column B by stating the question number and the letter e.g. 11.1 a.

Column A	Column B
11.1 $(a + b) + c = a + (b + c)$	a. Identity property
11.2 $-2 + 4x^2$	b. Distributive property
11.3 $9(a + 1) = 9a + 9$	c. Quartic equation
11.4 $-2x + 3 - x^3$	d. Commutative property
11.5 $5 + 0 = 0 + 5 = 5$	e. Quadratic equation
11.6 $a \times b = b \times a$	f. Associative property
	g. Inverse property
	h. Cubic equation

(6 Marks)

Question 12

Solve for x :

$$2(2x - 4) = 4(4 - 2x) - 36$$

(4 Marks)

End of Section B

You have now reached the end of this assessment. Ensure that you have answered all the required questions before submitting your examination answer book to the invigilator.

Column A	Column B
11.1 $(a + b) + c = a + (b + c)$	a. Identity property
11.2 $-2 + 4x^2$	b. Distributive property
11.3 $9(a + 1) = 9a + 9$	c. Quadratic equation
11.4 $-2x + 3 - x^2$	d. Commutative property
11.5 $2 + 0 = 0 + 2 = 2$	e. Quadratic equation
11.6 $a \times b = b \times a$	f. Associative property
	g. Inverse property
	h. Cubic equation

(8 Marks)