



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

(MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

MAIN EXAM

2023/2024 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMMUNITY HEALTH AND
DEVELOPMENT

COURSE CODE: PPC 112

COURSE TITLE: INTRODUCTION TO COLLEGE MATHEMATICS

DATE: 5/12/2023

TIME: 2.00-4.00 PM

INSTRUCTIONS TO CANDIDATES:

Answer Question ONE (Compulsory) and ANY other TWO Questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

Paper Consists of 3 Printed Pages. Please Turn Over



QUESTION ONE (COMPULSORY) [40 MARKS]

(a) Solve the following linear equations

i) $5(3 - a) - 2(5 - 2a) = 3$

[3marks]

ii) $-\frac{1}{2}(10x-2)+3=7(1-2x)$

[3 marks]

iii) $\frac{1}{3}x + \frac{1}{5} = \frac{1}{5}x - 1$

[3marks]

(b) Giving an example in each case, define the following terms;

(i) A Polynomial

[2marks]

(ii) Degree of a polynomial

[2marks]

(iii) Terms of a polynomial

[2marks]

(c) Solve and graph the solution on a number line;

(i) $-2(x + 8) + 6 \geq 20$

[3marks]

(ii) $-5 \leq 2x - 7 \leq 1$

[3MARKS]

(d) Simplify;

(i) $(5x^3 + 3x^2y + 4xy - 6y^2) - (3x^2 + 7x^2y - 2xy + 4xy^2 - 5)$

[3marks]

(ii) $(7x^3 + 2x^2 + 3x + 9)(5x^2 + 2x + 1)$

[3marks]

(iii) $\frac{\sqrt{9+h}-3}{h}$

[3marks]

(iv) $(-10x^2y^{-4})^2(z^3y)^{-5}$

[3marks]

(e) Factor the following using notable products

(i) $16x^4 - 1$

[4marks]

(i) $\frac{1}{256} + \frac{11}{40}x + \frac{121}{25}x^2$

[3marks]

QUESTION TWO (15MARKS)

(a) Find two consecutive odd numbers which are greater than 10 and have the sum of less than 40. [4marks]

(b) Divide the following polynomials;

(i) $\frac{x^3+3x^2-8x-4}{x-2}$ [2marks]

(ii) $\frac{3x^4-2x^3+6x^2+23x-7}{x^2-2x+5}$ [3marks]

- (c) Sketch the parabola of the function $y = 5x^2 + 4x - 12$ showing all the intercepts and the symmetry (vertex) [6marks]

QUESTION THREE (15MARKS)

(a) Malik stops at the grocery store to buy a bag of diapers and 2 cans of formula. He spends a total of \$37. The next week he stops and buys 2 bags of diapers and 5 cans of formula for a total of \$87. How much does a bag of diapers cost? How much is one can of formula? [3marks]

(b) Solve the polynomial $2x^5 + x^4 - 2x - 1 = 0$ [5marks]

(c) Sketch the graph of the cubic function $f(x) = x^3 - 4x^2 + x - 4$ stating all the intercepts and the critical points. [7marks]

QUESTION FOUR (15 MARKS)

(a) Solve by completing the square $9x^2 - 24x + 13$ [4marks]

(b) A store has requested a manufacturer to produce shorts and jackets for sell. The manufacturer has 750m^2 of cotton textile and 1000m^2 of polyester. Every pair of short (1 unit) needs 1m^2 of cotton and 2m^2 of polyester. Every jacket needs 1.5m^2 of cotton and 1m^2 of polyester. The price of shorts is fixed at \$50 and jackets at \$40. What is the number of shorts and jackets that the manufacturer must supply to the stores to obtain maximum sale? [11 marks]

