

Final Exam
FMTH003: BASIC MATHEMATICS I
Term1 - Fall 2024

Points of attention:

- For each question, the maximum earned points are specified in the question.
- Write clearly! Answers that are not readable are not marked and don't earn marks!
- All answers should be written in English using **blue or black pens** only.
- Use the pencil only for diagrams and graphs.
- Show all the calculation steps in the given space.
- When finished, submit the question paper, together with the answer scripts and the signed cover page to the invigilator.
- Any cheating/copying may result in an instant failing of the examination.

Exam Duration: 2 hours
Instructor's Name: Khaloud Ibrahim Al Ajmi
Exam Date: 17/11/2024
Program: FND

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	10

Student Information

Name: ID:
Signature:

Invigilator

Initials: ☐ Student ID checked
Time received:

Question 1.

[9 marks]

Circle the correct answer.

Example. 85 is a _____ digit number.			
a 1	b 2	c 3	d 4
1. What is the name of the following polynomial ($3x^3 + 2x^2 + 9$)?			
a. monomial	b. binomial	c. trinomial	d. linear
2. $(12x - 7) - (-5x + 12) =$ _____.			
a. $7x - 19$	b. $17x - 19$	c. $18x + 19$	d. $8x + 19$
3. $0.051 \text{ kg} =$ _____ g			
a. 0.000051	b. 0.0051	c. 51	d. 5.1
4. 9π is _____ number.			
a. a whole	b. a rational	c. a natural	d. an irrational
5. What is the simplest form of $\sqrt{32} - \sqrt{18}$?			
a. $7\sqrt{2}$	b. $\sqrt{50}$	c. 25	d. $2\sqrt{2}$
6. _____ is the simplified form of the algebraic expression $(\sqrt{y} + 2)(\sqrt{y} - 2)$.			
a. $y - 2$	b. $y^2 - 4$	c. $y - 4$	d. $y^2 - 2$
7. Factor the following expression completely ($21x^3 + 7x^4$).			
a. $7x^3(3 + x)$	b. $14x^3(2 + x)$	c. $(29x^7)$	d. $(x + 3)(x + 4)$
8. $(\frac{3}{2} - \frac{5}{8}) =$ _____.			
a. $\frac{-7}{16}$	b. $\frac{17}{8}$	c. $\frac{7}{8}$	d. $\frac{-6}{4}$
9. The value of 'x' in the equation $\frac{1}{3}x - 8 = 2$ is _____.			
a. $x = 10$	b. $x = -10$	c. $x = 30$	d. $x = 24$

Question 2.**[5 Marks]**

A software developer earns an annual salary, which includes a yearly bonus of \$5,200. If the developer's total yearly earnings are \$72,400, what is the developer's monthly salary?

Question 3.**[5 Marks]**

Simplify the following rational expression:

$$\frac{\frac{x^3}{x+1}}{\frac{x}{x^2+2x+1}}$$

Question 4.**[5 Marks]**

Find the quotient and remainder using synthetic division for the following expression.

$$P(x) = x^3 - 9x^2 + 27x - 27 ; x - 3$$

Question 5.**[3 Marks]**

Ahmed wants to purchase a laptop priced at 600 rials. If the sales tax rate is 10%, what will be the total cost of the laptop?

Question 6.**[3 Marks]**

The distance from Jupiter to the sun is about 778 million kilometers. Express this distance in scientific notation. Write this distance in scientific notation.

Question 7.**[6 Marks]**

Simplify the following expression and eliminate any negative exponents.

a. $\frac{a^{5/3} b^{7/3}}{a^{-2/3} b^{1/3}}$

(3 marks)

b. $(2a)^3(2ba^2)^{-3}$

(3 marks)

Question 8.**[4 marks]**

Find all real solutions of the following equation.

$$\frac{2}{5}x - 1 = \frac{3}{10}x + 7$$

Units Conversion Table

$1 \text{ km} = 1000 \text{ m}$	$1 \text{ m} = 100 \text{ cm}$
$1 \text{ cm} = 10 \text{ mm}$	$1 \text{ kg} = 1000 \text{ g}$
$1 \text{ g} = 1000 \text{ mg}$	$1 \text{ l} = 1000 \text{ ml}$
$1 \text{ tonne} = 1000 \text{ kg}$	$1 \text{ cm}^3 = 1 \text{ ml}$
$1 \text{ foot} = 12 \text{ inches}$	$1 \text{ yard} = 3 \text{ feet}$
$1 \text{ mile} = 1760 \text{ yards}$	$1 \text{ gallon} = 8 \text{ pints}$
$F = \frac{9}{5} C + 32$	$C = \frac{5}{9} (F - 32)$

References:

Larson, R. and Hostetler, R. (2007) *Precalculus*. 7th edn. Boston: Houghton Mifflin Company.

Stewart, J., Redlin, L. and Watson, S. (2017) *Precalculus Mathematics for Calculus*. 7th edn.
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