# ACADEMIC YEAR 2023 – 2024

| Program | Term | Semester | Paper |
|---|---|---|---|
| **FOUNDATION** | **2** | **2** | **MAIN 1** |

| MODULE NAME: | **BASIC MATHEMATICS II** | | |
|---|---|---|---|
| MODULE CODE: | **FMTH004** | EXAM DATE: | **22/07/2024** |
| TEACHER'S NAME: | **KHALOUD AL AJMI** | DURATION: | **2 hrs.** |

| Questions to be answered on: | Allowed requirements | Number of pages |
|---|---|---|
| Space provided on the question paper | Pen<br>Pencil (only for drawing) | (Incl. Cover Page): 09 |

**Points of Attention:**

- For each question, the maximum earned points are mentioned between brackets at the end of each question.
- Write very clearly! Answers that are not readable are not marked and don't get points!
- Make sure your answers are written to the point.
- All answers must be written **in English**.
- Write all the answers **in blue or black pen only**.
- When finished, submit the question paper, together with the answer scripts and the signed cover page to the invigilator.
- Any cheating/copying may fail the examination.

**FINAL MARKS**

| STUDENT NAME: | |
|---|---|
| STUDENT ID: | |
| CLASS: | |

**40**

Number of answer scripts: ………………………      Invigilator: ………….……...........

Student's signature: ………………………………      Time of receipt: …………….........

## Question 1 [9 Marks]

Sketch a triangle that has acute angle $\theta$, and find the other five trigonometric ratios of $\theta$.

If $\tan \theta = \dfrac{5}{6}$

## Question 2 [6 Marks]

Find two positive angles and two negative angles that are coterminal with the angles given below.
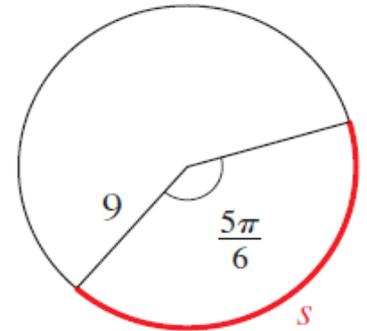
a.  $135°$ (3 marks)

b.  $\frac{3\pi}{4}$ (3 marks)

## Question 3 [5 Marks]

Find the length of $s$ of the given circular figure below.

## Question 4             [5 Marks]

The equations of two lines are given. Determine whether the lines are parallel, perpendicular, or neither.

$$y = 2x + 3 \quad ; \quad 2y - 4x - 5 = 0$$

Show that the points $A(-2,9)$, $B(4,6)$, $C(1,0)$ and $D(-5,3)$ are the vertices of a square.

A car rental company offers two plans for renting a car.

Plan A**:** $30 per day and 10¢ per kilometers         Plan B**:** $50 per day with free unlimited kilometer

For what range of kilometers will Plan B save you money?

Test the equation given below for symmetry.

$y = x^4 + x^2$

**Formula Sheet**

| Equation of circle $$(x-a)^2 + (y-b)^2 = r^2$$ | $$Slope = m = \frac{y_2 - y_1}{x_2 - x_1}$$ |
|---|---|
| Distance formula $$d = \sqrt{(x_2 - x_1)^2) + (y_2 - y_1)^2)}$$ | $$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$ |

**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. Cengage.