

FINAL EXAM

FMTH004: BASIC MATHEMATICS - II

Fall-T2 2024-25

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 and sign the question paper to the invigilator.
- Any cheating/copying may result in an instant failing of the examination.

Exam Duration: 2 hours
Instructor's Name: Khaloud Al Ajmi
Exam Date: 09/02/2025
Program: FND

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Student Information

Name: ID:
Signature:

Invigilator

Initials: ☐ Student ID checked
Time received:

Question 1. Find the values of the trigonometric ratios of θ from the given information.

$$\cos \theta = \frac{2}{5}, \sin \theta < 0$$

[7 Marks]

Question 2. Find the exact values of the following trigonometric functions.

[6 Marks]

a. $\sin(-30)^\circ$

(3 marks)

b. $\sec 120^\circ$

(3 marks)

Question 3. A kite is flying at a height of 50m , and the string attached to it makes an angle of 60° with the ground. How long is the string? **[4 Marks]**

Question 4. A sector of a circle with a radius of 50 cm has an area of 500 cm^2 . Find the central angle of the sector in radians and degrees. **[4 Marks]**

Question 5. Determine whether the following lines are parallel, perpendicular, or neither.

[6 Marks]

a. $y = \frac{1}{2}x + 4$; $2x + 4y = 1$

(3 marks)

b. $-3x + 4y = 4$; $4x + 3y = 5$

(3 marks)

Question 6. Which of the points $A(6, 7)$ or $B(-5, 8)$ is closer to the origin?

[4 Marks]

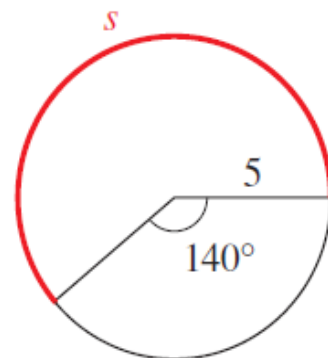
Question 7. Test the following equation for symmetry.

[4 Marks]

$$x = y^4 - y^2$$

Question 8. Find the length s in the circular arc given below.

[5 Marks]



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 $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Trigonometric Table

θ°	$\theta \text{ (rad)}$	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\csc \theta$	$\sec \theta$	$\cot \theta$
0	0	0	1	0	<i>undefined</i>	1	<i>undefined</i>
30°	$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	2	$\frac{2\sqrt{3}}{3}$	$\sqrt{3}$
45°	$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	$\sqrt{2}$	$\sqrt{2}$	1
60°	$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2	$\frac{\sqrt{3}}{3}$
90°	$\frac{\pi}{2}$	1	0	<i>undefined</i>	1	<i>undefined</i>	0