2025

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منصة ليرن

Prince Sultan University

MATH002

(كتاب التدريبات)

MATH-PYP
DEPARTMENT

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Prince Sultan University
College of Humanities and Sciences
PYP-MATH Department

منصة ليرن
للدورات التعليمية

Course Title: Preparatory Mathematics II
Course Code: Math 002
Midterm Exam
Thursday 7-3-2024 (Term 232)
Test Duration: 90 Minutes

Name: _____	**ID:** _____
Section: _____	**Instructor's Name:** _____

For the students:

- **You may use a scientific calculator that does not have programming or graphing capabilities. NO borrowing calculators.**
- **NO talking or looking around during the examination.**
- **NO mobile phones. If your mobile is seen or heard, your exam will be taken immediately.**
- **Show all your work and be organized.**
- **You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.**
- **This exam consists of 7 pages and 6 questions.**

GRADING:

Questions	Q1	Q2	Q3	Q4	Q5	Q6	Total	Total
Marks	0/10	0/10	0/10	0/10	0/10	0/10	0/60	0/20

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Question #1:
Write the <u>final answer</u> on the right side. No steps needed. **(1 mark each = 10 marks)**

	Question	Answer
1	Give a positive <u>coterminal</u> angle for $\theta = -50°$	
2	$5^{\log_5(x+2)}$	
3	Find the domain of $y = \cos^{-1} x$	
4	Write the equation $\ln x = 2$ in its equivalent exponential form	
5	Convert the following angle to radian $\theta = 350°$	
6	Classify the angle as acute, right, obtuse, or straight : $\theta = \frac{\pi}{3}$	
7	Find the <u>asymptote</u> of $f(x) = e^{x+1} + 3$	
8	Find the <u>Range</u> of $y = -3 \sin 4x$	
9	Name the quadrant in which $\theta = -\frac{6\pi}{7}$ lies	
10	Use the calculator to find the value of $\sec \frac{\pi}{5}$. Round to one decimal place.	

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(2 mark each = 10 marks)

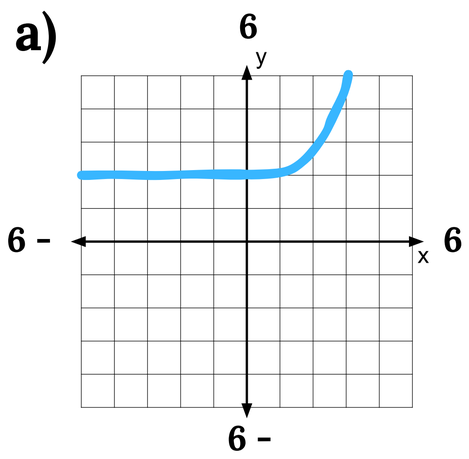
Question #2: Choose the correct answer

1) Find the **length of the arc** on a circle of **radius 12** meters intercepted by a **central angle** of **70°**. Round to **two decimal places.**

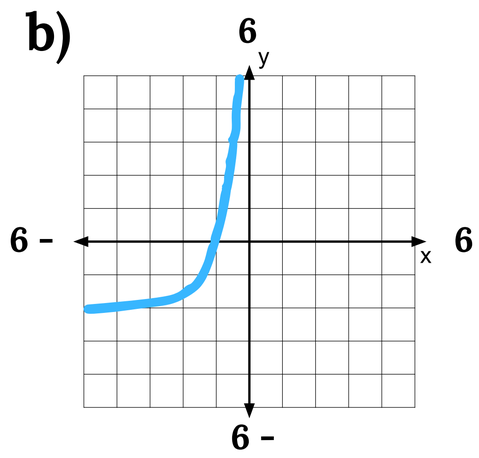
- a) 84 m
- b) 14.66 m
- c) 840 m
- d) 5.83 m

2) Use the graph of $f(x)$ to obtain the graph of $g(x) = 3^{x+2} + 2$.

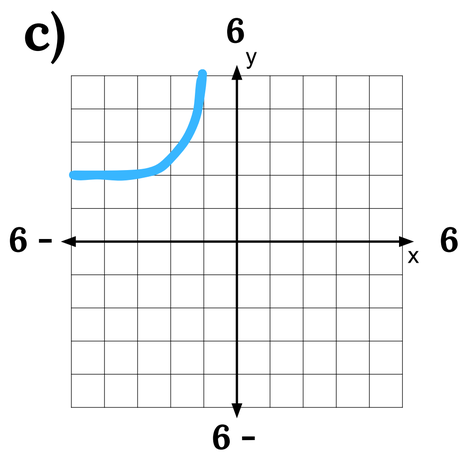
a)



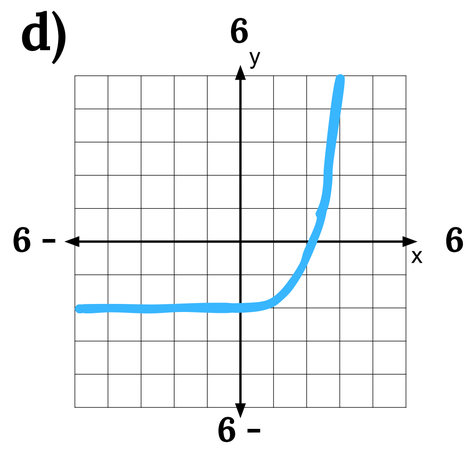
b)



c)

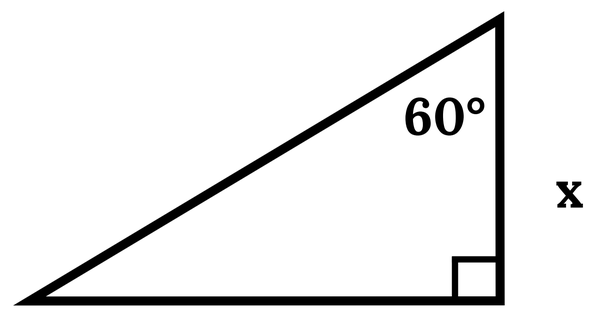


d)



3) Find the **length** of side x. Round your answer to the **nearest whole number.**

- a) 28
- b) 9
- c) 18
- d) 32



4) Find a **cofunction** of $\sec 50°$.

- a) $\cos 40°$
- b) $\sin 40°$
- c) $\sec 40°$
- d) $\csc 40°$

5) Express $\log_3 2$ using the **Natural logarithm.**

- a) $\frac{\ln 2}{\ln 3}$
- b) $\frac{\ln 3}{\ln}$
- c) $\frac{\log 3}{\log 2}$
- d) $\frac{\log 2}{\log 3}$

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Question #3: **(10 points)**

A. Use the **reference angle** to find the exact value of the following (**Show all steps**).

(2.5 points)

$$\tan\frac{2\pi}{3}$$

B. Expand the following logarithmic expression.

(3.5 points)

$$\log_7\left(\frac{x^4\sqrt[3]{x-5}}{49(x+1)^5}\right)$$

C. Find the domain of $f(x)=\log(x^2-13x+40)$. **(Show all steps)**

(2 points)

D. A telephone pole is **40 feet** tall. A guy wire **90 feet** long is attached from the ground to the top of the pole. Find the **angle between the wire and the pole** to the **nearest degree**.

(2 points)

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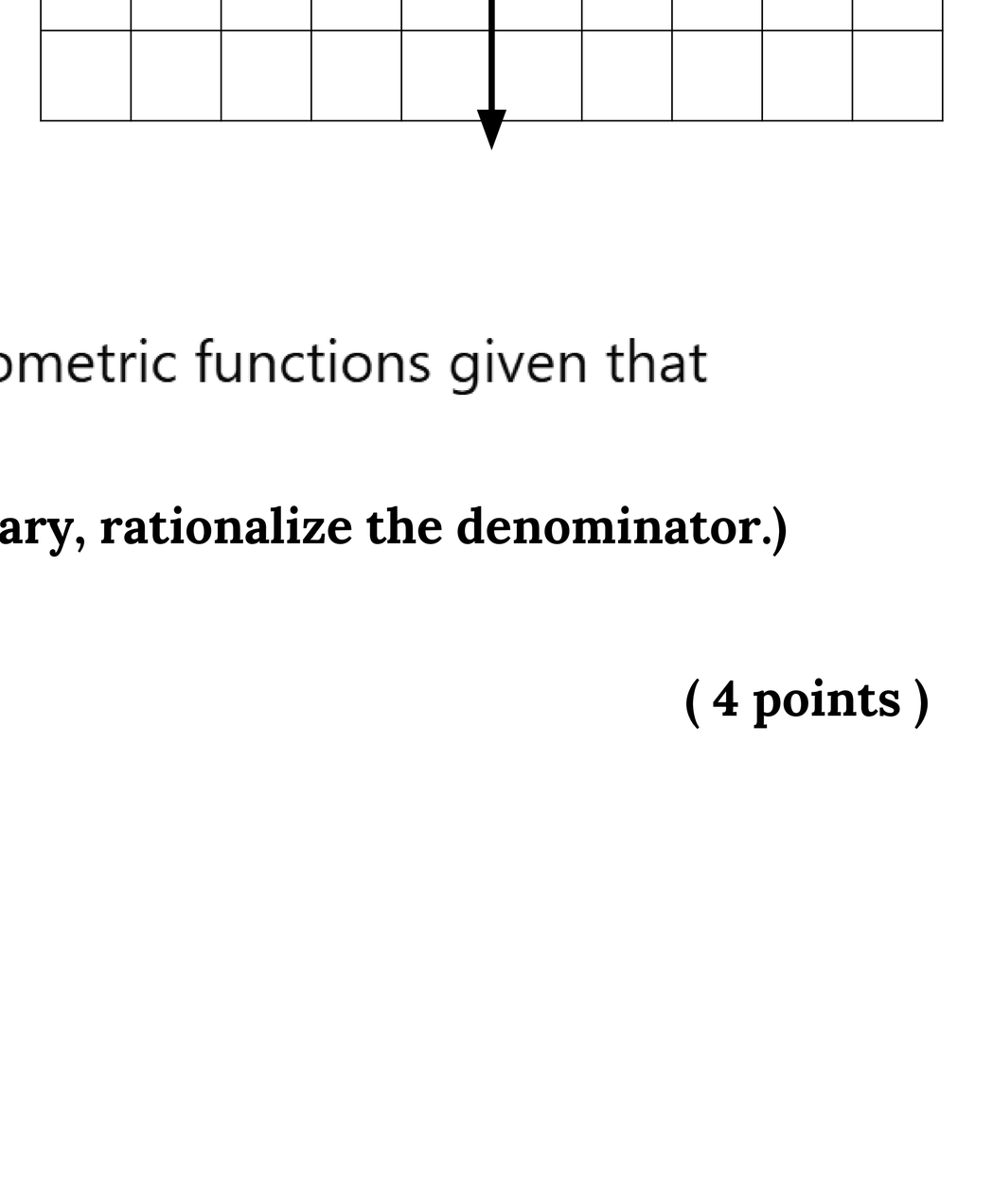
Question #4: (10 points)

A. Determine the **amplitude, period, and phase shift**, then **graph** one period of the function.

$$y = -2\cos\left(x + \frac{\pi}{2}\right)$$

(6 points)

x	y	(x,y)



B. Find the exact value of the remaining trigonometric functions given that

$\cot\theta = -\frac{2}{3}$, and $\sin\theta < 0$. **(Where necessary, rationalize the denominator.)**

(4 points)

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Question #5:

Solve the following equations : **(10 points)**

i. $\log_5(x-4) - \log_5(x+3) = \log_5 8$ **(5 points)**

ii. $8^{2x} - 8^x - 30 = 0$ **(Round to two decimal places)** **(5 points)**

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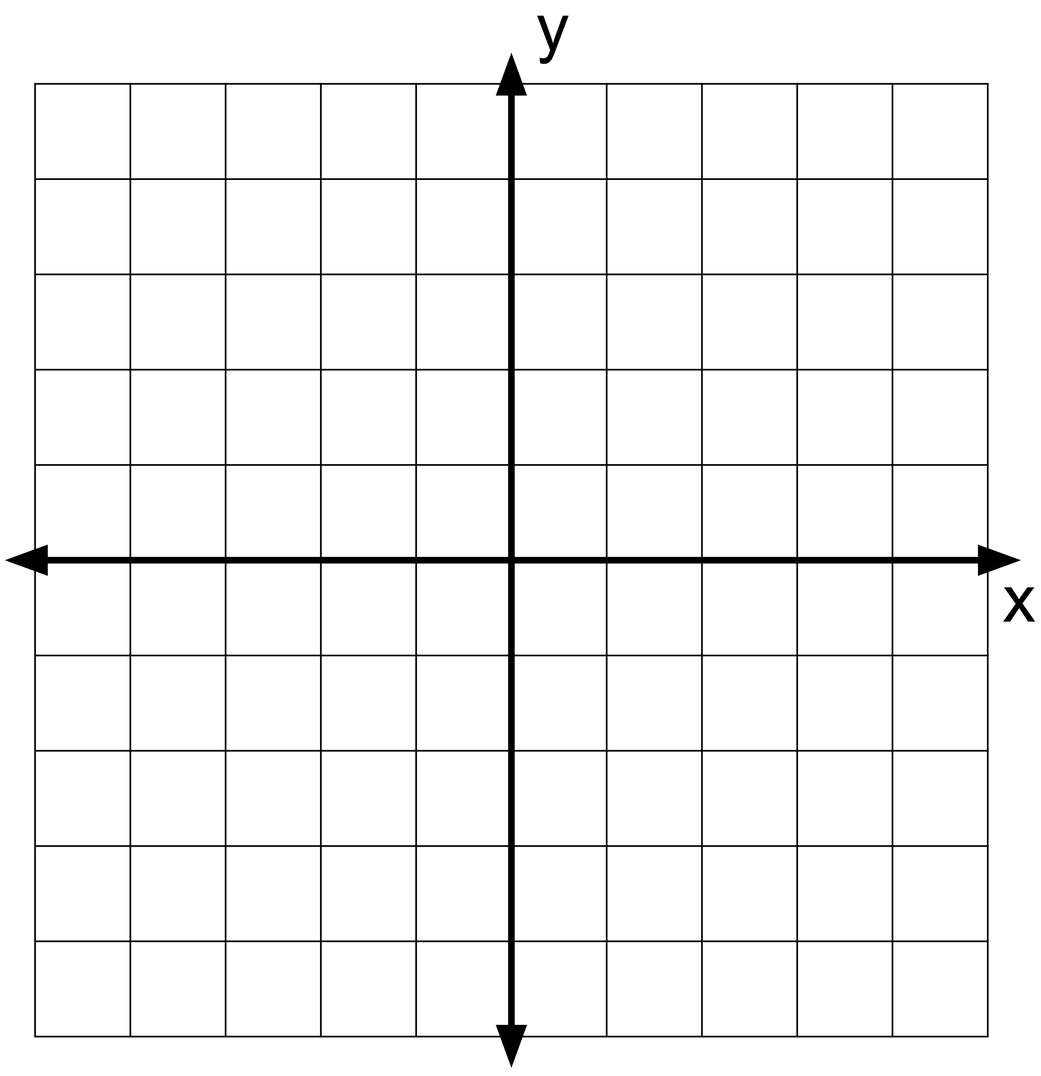
(7 points)

Question #6

Begin by Graphing $f(x) = \log_3 x$. Then use transformation of this graph to graph the given function. Give the equation of the **asymptote** of $g(x)$. Use the graph to determine the **domain** and **range** of $g(x)$.

g(x) = log (x + 2) - 1

x	y	(x,y)	



g(x) = log (x + 2) - 1	
Domain	
Range	
Asymptote	

B. Write the following expression as an **algebraic expression**. Assume that **t** is positive.

$$\cos\left[\sin^{-1}\left(\frac{t}{5}\right)\right]$$

(Show all your steps) **(3 points)**

Good luck (: