



COURSE DETAILS:

ORIENTATION MATHEMATICS I		MATH 002	MAJOR EXAM I	A
Semester:	Spring Semester --Term 172			
Date:	Wednesday February 28, 2018			
Time Allowed:	90 minutes			

STUDENT DETAILS:

Student Name:	
Student ID Number:	
Section:	
Instructor's Name:	

INSTRUCTIONS:

- 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.

GRADING:

	Page 1	Page 2	Page 3	Page 4	Page 5	Total	Total
Questions							
Marks	10	10	20	20	20	80	20

Q.1 (20 points) Choose the correct answer

- 1) Write $x^4 = 12$ in logarithmic form.
A) $\log_{12} x = 4$
B) $\log_4 x = 12$
C) $\log_x 12 = 4$
D) $\log_4 12 = x$
- 2) Convert 300° to radian measure (round to 3 decimal places).
A) 10.472
B) 1.047
C) 5.236
D) 2.094
- 3) Find a positive angle less than 2π that is coterminal with the angle $\frac{17\pi}{5}$.
A) $\frac{7\pi}{5}$
B) $\frac{27\pi}{5}$
C) $\frac{2\pi}{5}$
D) $\frac{12\pi}{5}$
- 4) If $\sin \theta < 0$ and $\sec \theta > 0$. Determine the quadrant in which θ lies.
A) *QI*
B) *QII*
C) *QIII*
D) *QIV*
- 5) Find the reference angle that corresponds to the angle $\theta = \frac{-23\pi}{6}$
A) $\frac{\pi}{6}$
B) $\frac{2\pi}{3}$
C) $\frac{\pi}{3}$
D) $\frac{-\pi}{6}$

You must write the correct answer to each question in the box below

Question	1	2	3	4	5
Answer					

6) If $\theta = 2.6$. Determine the quadrant in which θ lies.

- A) QI
- B) QII
- C) $QIII$
- D) QIV

7) If $\cos \theta = \sin \frac{3\pi}{8}$, then θ is:

- A) $\frac{5\pi}{8}$
- B) $\frac{13\pi}{8}$
- C) $\frac{-5\pi}{8}$
- D) $\frac{\pi}{8}$

8) Find the horizontal asymptote for the function $y = 5(2)^x + 3$

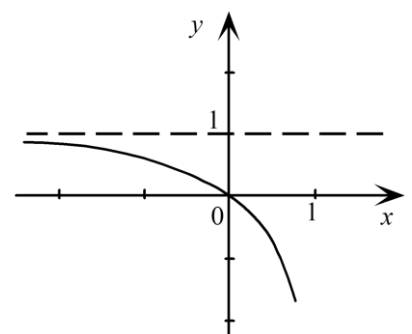
- A) $x = 3$
- B) $y = -3$
- C) $y = 3$
- D) $y = 5$

9) Solve the logarithmic equation: $\log_4(x+2) + \log_4(x-4) = 2$

- A) $\{6\}$
- B) $\{-4, 6\}$
- C) $\{-4\}$
- D) $\{7\}$

10) A possible equation for the graph shown is

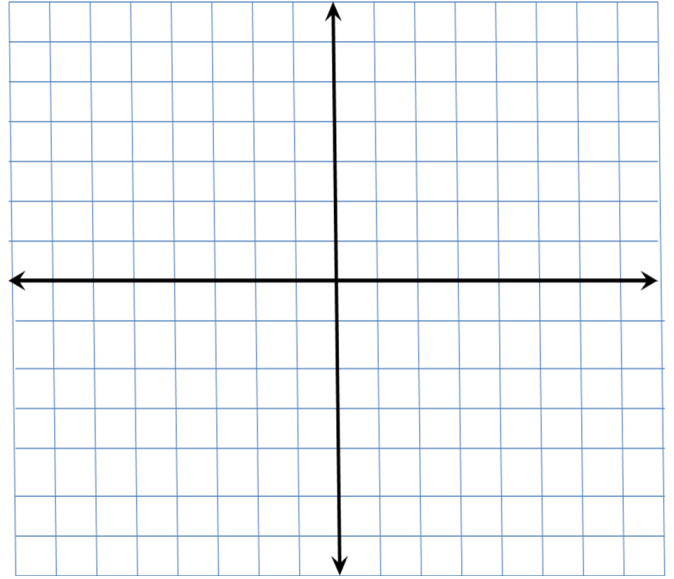
- A) $y = 1 - 10^x$
- B) $y = 1 - 10^{-x}$
- C) $y = 1 + 10^x$
- D) $y = 1 + 10^{-x}$



You must write the correct answer to each question in the box below

Question	6	7	8	9	10
Answer					

Q.2 (8 points) : Graph of the function $g(x) = 2^{x-3} + 1$, Find the **domain, the range, y-intercept** and **asymptote(s)** of $g(x)$.



Q.3 (4 points): Expand the following logarithmic expression as much as possible. **Simplify** when possible.

$$\log_3 \left[\frac{y^3 \cdot \sqrt[5]{x+1}}{27x^2} \right]$$

Q.4 (8 points) : The function $f(x) = 34 - 2.6 \ln x$ models the number of children under 18 as a percentage of the total population in USA, where x is the number of years after 1969.

a) What will be the percentage of children in 2000?

b) When will the percentage of children be 24.3%?

Q.5 (5 points) : Find the domain of the function: $f(x) = \ln\left(\frac{1-x}{x+4}\right)$

Q.6 (10 points) : Solve the following equations.

a) $5^{2x+1} = 125^{3x}$

b) $e^{4x} + 5e^{2x} - 24 = 0$

Q.7 (5 points): If $P(5, -2)$ is a point on the terminal side of angle θ . Find the exact value of $5\csc\theta + 2\sec\theta$. **Simplify your answer.**

Q.8 (8 points): Use **reference angle** and a **sketch** to find the **exact value**. **Don't** use the calculator directly and **show all your steps**.

a) $\cos\left(\frac{-31\pi}{6}\right)$

b) $\csc(570^\circ)$

Q.9 (7 points): Given that $\cos \theta = \frac{7}{15}$ and $270^\circ < \theta < 360^\circ$. Find the exact value of the remaining trigonometric functions of θ .

Q.10 (5 points): Find the length of the arc that corresponds to the central angle $\theta = 210^\circ$ in a circle with radius 7 inches. Round your answer to **two decimal** places.