Math 113, Chapter 1 Quiz SAMPLE

Name: _____ **Section:** _____

You have 30 minutes to complete the following problems, without using your notes, book, or calculator.

Part 1: Algebraic and Exponential Functions

1. Classify each function given below, by circling the appropriate name or names.

   (a) $f(x) = 2^x$

   root power polynomial exponential

   (b) $g(x) = x^5$

   rational power root polynomial

   (c) $h(x) = \dfrac{x}{2x-1}$

   algebraic power rational root

   (d) $Q(t) = t^{1/4}$

   power root exponential rational

   (e) $P(x) = x^3 - 6x + 4$

   linear power algebraic polynomial

2. State the domain of each function from the previous problem.

   (a) _____

   (b) _____

   (c) _____

   (d) _____

   (e) _____

3. Find a formula for a linear function $f(x)$ whose graph passes through $(3, 1)$ and has a slope of 2.

4. Find a formula for an exponential function $Q(t)$ whose initial value is $Q(0) = 27$ and which decreases by one third for every unit time: $Q(1) = 9$, $Q(2) = 3$, etc.

Part 2: Trigonometry

5. Fill in the following table, using the five standard angles in the first quadrant.

Angle, θ		$\sin\theta$	$\cos\theta$	$\tan\theta$
deg	rad			

6. Evaluate the function at the given value.

(a) $\cos(-150°)$ = _____

(b) $\sec(\frac{5\pi}{3})$ = _____

Part 3: Logarithms

7. Find the exact value of the given quantity:

(a) $\ln(1)$ = _____

(b) $\ln(e^3)$ = _____

(c) $e^{-3\ln 2}$ = _____

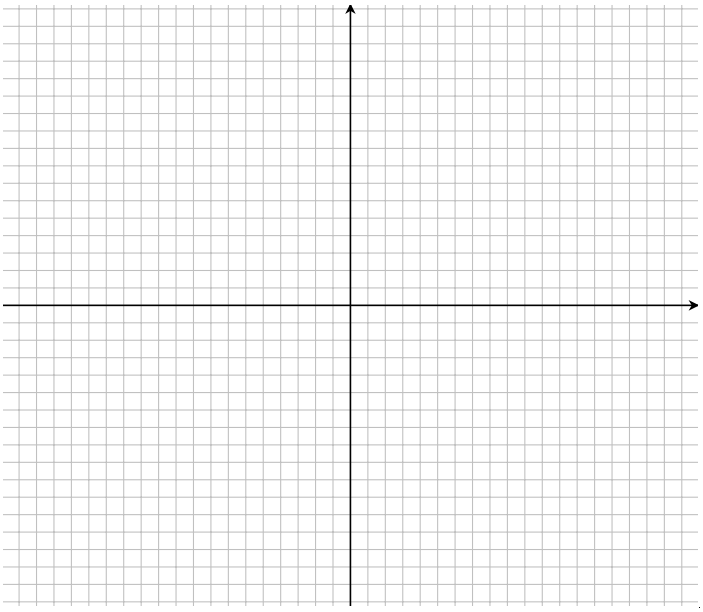
8. Express $\ln 4 - \ln 5 + 3\ln 3$ as a single logarithm: _____ . (Show your work below.)

9. Consider the function $f(x) = \ln(x+2)$. Give the domain, range, and x-intercept in the spaces provided, and sketch the graph on the axes provided. Make sure to provide scale on each axis.

Domain: _____

Range: _____

x-intercept: _____



Part 4: Inverse Functions and Inverse Trig Functions

10. Determine whether each function is one-to-one. If it is one-to-one, sketch a graph of its inverse on the same set of axes.

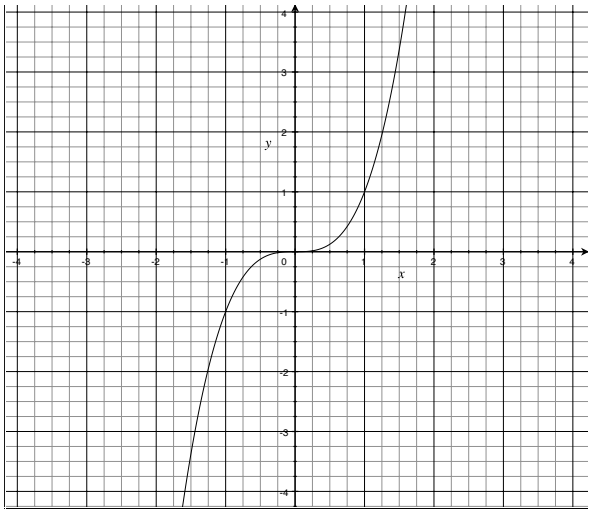


Figure 1: Is this function one-to-one? Y/N

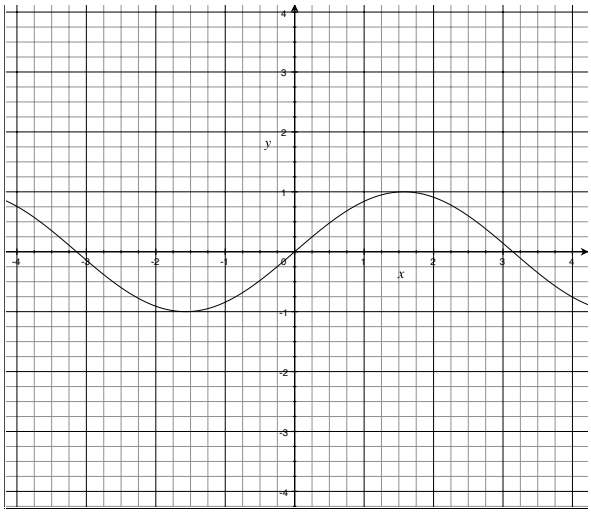


Figure 2: Is this function one-to-one? Y/N

11. Find the exact value of the given quantity:

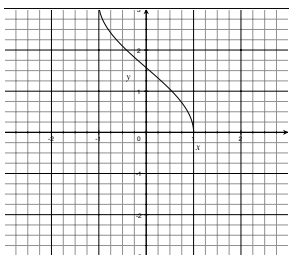
(a) $\cos^{-1}(\frac{\sqrt{3}}{2})$ = _____

(b) $\tan^{-1}(1)$ = _____

(c) $\arcsin(0)$ = _____

12. The graph of which function is depicted below?

$f(x) = \arcsin(x)$ $g(x) = \cos^{-1}(x)$ $h(x) = \sec(x)$ $r(x) = \arctan(x)$



Part 5: Composition of Functions

13. Find formulas for the functions $f \circ g$ and $g \circ f$, where

$$f(x) = 2x + 3 \quad \text{and} \quad g(x) = \sin x$$

$(f \circ g)(x) =$ _____

$(g \circ f)(x) =$ _____

14. Express the function in the form $f \circ g$.

(a) $F(x) = (x-2)^2$

$f(x) =$ _____

$g(x) =$ _____

(b) $G(x) = \tan^2(x)$

$f(x) =$ _____

$g(x) =$ _____

(c) $H(x) = \dfrac{2x}{2x-3}$

$f(x) =$ _____

$g(x) =$ _____