

Practice Problems - Final: Part 1 (Due Wed, May 28)

Math 1060Q – Summer 2014

Professor Hohn

1. $<$, $>$, or $=$.

(a) $\tan(100^\circ)$ $\tan(1^\circ)$

(b) The solution x of $\log_{\sqrt{8}} x = \frac{8}{3}$ 10

(c) The period of the function $f(x) = 3 \sin(\pi x - 5) + 7$ The amplitude of the function
 $f(x) = 3 \sin(\pi x - 5) + 7$

(d) $3 \log_2 3$ $2 \log_5 6$

(e) The period of $f(x) = 4 \tan(3x)$ The period of $g(x) = 4 \cos(3x)$

2. Find all solutions to $\sin(2x) + \cos x = 0$ on the interval $[0, 2\pi)$.

3. Give an example of a function that is neither even nor odd, and explain why it is neither.

4. Where is the function $f(x) = \frac{\sqrt{\sin x}}{x^2 - 4x + 3}$ defined on the interval $[0, 2\pi]$? Write your answer as a union of intervals.

5. Find an exact expression for $\sin(75^\circ)$.

6. Find all real numbers x such that $12x^4 + 5x^2 - 2 = 0$.

7. Find the domain and range of $f(x) = \log(-x)$. What is the inverse function of $f(x)$? Find the domain and range of the inverse function of $f(x)$.

8. Prove the following identity

$$\sin \theta \cos \theta = \frac{\tan \theta}{1 + \tan^2 \theta}.$$

9. Find the linear function, $y = mx + b$, that passes through the vertices of $y = x^2 + 4x$ and $y = 2(x + 1)^2$.

10. A population of 8 frogs increases at an annual rate of 50% a year. How many frogs will there be in 4 years?

11. Suppose $\sin u = \frac{3}{7}$. Evaluate $\cos(2u)$.

12. Suppose $9^x = 4$. Evaluate $(\frac{1}{27})^{2x}$.

13. The function f is defined by $f(-3) = 8$, $f(1) = 4$, and $f(4) = -8$. Make a table for $g(x)$ where $g(x) = 2f(-5x + 1) - 3$.

14. What is $\sin^{-1}(\sin(\frac{3\pi}{4}))$?

15. What is the minimum value of the function f defined by $f(x) = 9x^2 + 30x + 18$?

16. Find an exact expression for $\sin(\frac{\pi}{8})$.