

Math 121 Fa13 Chapter 5 and 6

Name: _____ TA: _____

Exam 2 Form A

1.) (4pts) Find the inverse f^{-1} of $f(x) = -\frac{3x+1}{x}$

2.) (6pts) Consider $y = -e^{x+2}$

a. Find the domain.

b. Find the range.

c. Find any asymptotes.

3.) (4pts) As Tyrion is looking over the Seven Kingdom's records, he notices that an investment of 4000 gold coins was made with the Iron Bank for three years at an annual interest rate of 3%. How many gold dragons were earned as interest? (Just set up equation, do not need to solve)

4.) (12pts) Solve the following exponential and logarithmic equations:

a. $8^{-x+14} = 16^x$

b. $\log_5 x = 2$

c. $\log x + \log(x - 21) = 2$

d. $3^{1-2x} = 4^x$

5.) (4pts) Newton's Law of Cooling: $u(t) = T + (u_0 - T)e^{kt}$, $k < 0$

A thermometer reading 72°F is placed in a refrigerator where the temperature is a constant 38°F.

If temperature reads 60°F after 2 minutes, solve for k (leave exact value).

6.) (6pts) Consider a sector of a circle with angle $\pi/4$ radians and radius 3 inches.

a. Find the arc length of the sector.

b. Find the area of the sector.

7.) (18pts) Calculate the following trig functions at the given angles.

a. $\cos\left(\frac{5\pi}{6}\right)$

b. $\cot\left(\frac{-2\pi}{3}\right)$

c. $\csc(0)$

d. $\tan(7\pi)$

e. $\sec\left(\frac{5\pi}{4}\right)$

f. $\sin(60^\circ)$

8.) (6pts) Given that a point on the terminal side of an angle is $(-2, 11)$, find the values of the six trig functions at that angle.

9.) (6pts) Suppose $\cos \theta = 0.23$. Find the following:

a. $\cos \theta + \cos(-\theta) - \cos(\theta + 6\pi)$

b. $\frac{\cos^4 \theta}{\tan^2 \theta + 1} + \sin^2 \theta - \cos \theta$

10.) (5pts) Consider $f(x) = 3\sin(5x - 1)$

- a. Period:
- b. Amplitude:
- c. Reflection:
- d. Vertical Shift:
- e. Phase Shift:

11.) (10pts) Consider the following function: $f(x) = \tan(x)$

a. Sketch a graph of the function. Show at least one period.

b. What is the period of the function?

c. What is the domain? Range?

d. What are the x and y intercepts?

e. Are there any asymptotes? If so, where?

f. What is the maximum value and where does it occur?

g. What is the minimum value and where does it occur?

12.) (4pts) Sketch a graph of the function $f(x) = -5\sec(2x) + 1$. Show at least one period.