Math 220 (section ???) Quiz 1 Fall 2010

Name SOLUTIONS

- No calculators allowed.
- Show sufficient work to justify each answer.
- You have 15 minutes for this quiz.

1. (2 points) Is the following function even, odd or neither?

$$f(x) = \frac{8x^3}{x^4+5}$$

$$f(-x) = \frac{8(-x)^3}{(-x)^4+5}$$

$$= \frac{-8x^3}{x^4+5}$$

$$= -f(x)$$ so f is odd

2. (2 points) What is the domain of the function $f(x) = \sqrt{3-\sqrt{x-2}}$?

$x-2 \geq 0 \Rightarrow x \geq 2$

$3-\sqrt{x-2} \geq 0 \Rightarrow 3 \geq \sqrt{x-2} \Rightarrow 9 \geq x-2 \Rightarrow 11 \geq x$

so $2 \leq x \leq 11$

The domain of f is $[2, 11]$

3. (1 point) Given that $f(x) = x^2+1$ and $g(x) = 3x-2$, evaluate and simplify $(g \circ f)(2)$.

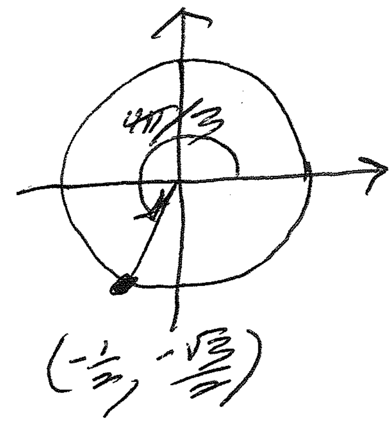
$(g \circ f)(2) = g(f(2))$

$= g(5)$

$= 13$

4. (1 point) Evaluate and simplify $\sec(4\pi/3)$.

$$\sec\left(\frac{4\pi}{3}\right) = \frac{1}{\cos\left(\frac{4\pi}{3}\right)} = \frac{1}{-1/2} = -2$$



5. (2 point) Determine real numbers a and b so that the expression $5\tan^2\theta + 2\sec^2\theta$ can be rewritten as $a\sec^2\theta + b$.

$$5\tan^2\theta + 2\sec^2\theta = 5(\sec^2\theta - 1) + 2\sec^2\theta = 7\sec^2\theta - 5$$

so $a = 7$, $b = -5$

6. (2 points) Carefully sketch a graph of the function $f(x) = 5 - 2\cos x$ on the interval $[0, 2\pi]$.