Math 220 (section AC2)  
Quiz 1  
Spring 2012

Name

- 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?

\[ f(x) = \begin{cases} 
2 & : x > 0 \\
1 & : x = 0 \\
-2 & : x < 0 
\end{cases} \]

neither

2. (2 points) What is the domain of the function \( f(x) = \frac{4x^2 + x + 1}{\sqrt{3 - x}} \)?

\[ 3 - x > 0 \]

\[ x < 3 \quad \text{or} \quad (-\infty, 3) \]

3. (1 point) Evaluate and simplify sec(5π/4).

\[ \sec \left( \frac{5\pi}{4} \right) \]

\[ \cos \left( \frac{5\pi}{4} \right) = \frac{1}{-\frac{\sqrt{2}}{2}} \]

\[ = -\frac{2}{\sqrt{2}} = -\sqrt{2} \]
4. Given that \( f(x) = x^2 + x - 1 \) and \( g(x) = 4x + 2 \), evaluate and simplify

(a) (1 point) \( (g \circ f)(-3) \)

\[
\begin{align*}
g(f(-3)) &= g(( -3)^2 + (-3) - 1) \\
&= g(-3 - 1) \\
&= g(-4) \\
&= 4(-4) + 2 \\
&= \sqrt{22} 
\end{align*}
\]

(b) (2 points) \( \frac{f(x+h) - f(x)}{h} \)

\[
\begin{align*}
(x+h)^2 + (x+h) - 1 - (x^2 + x - 1) &= \frac{h}{h} \\
&= x^2 + 2xh + h^2 + x + h - 1 - x^2 - x + 1 \\
&= \frac{2xh + h^2 + h}{h} \\
&= 2x + h + 1
\end{align*}
\]

5. (2 points) Carefully sketch a graph of the function \( f(x) = -2 + \sqrt{-x} \) using transformations of the function \( y = \sqrt{x} \).

\( -x \) means flip about y-axis
\( -2 \) means shift down 2