

Math 1A: Section 308  
 Quiz 1 - September 2, 2009

Name: Key

1. Find the domain of the following functions: (Write your answers in interval or set notation)

1 pt (a)  $h(x) = \frac{3x + |x|}{x}$

The only problem is when  $x=0$   
 So  $D = (-\infty, 0) \cup (0, \infty)$

2 pt (b)  $f(u) = \sqrt{u+2} + \sqrt{u+3}$

$\sqrt{u+2}$  is defined if  $u+2 \geq 0$   
 or  $u \geq -2$   
 $\sqrt{u+3}$  is defined if  $u+3 \geq 0$   
 or  $u \geq -3$   
 So they are both defined when  $u \geq -2$   
 $D = [-2, \infty)$

3 pt (c)  $g(x) = \ln(-x^2 - x + 6) + \frac{1}{x}$

$\frac{1}{x}$  is defined if  $x \neq 0$ .

$\ln(-x^2 - x + 6)$  is defined if  $-x^2 - x + 6 > 0$ , or  $x^2 + x - 6 < 0$ .

Factor:  $(x-2)(x+3) < 0$

$\begin{array}{c} + + + \quad + - - - \quad + + + \\ | \quad \quad \quad | \\ -3 \quad \quad \quad 2 \end{array}$

2. Sketch a graph of the following function:

4 pt

$$f(x) = \begin{cases} e^x + 2 & \text{if } x \leq 0 \\ x + 3 & \text{if } 0 < x \leq 1 \\ \sin(x-1) & \text{if } x > 1 \end{cases}$$

So both are defined on  $(-3, 0) \cup (0, 2)$

