

Quiz 3  
Math 230

1. Consider the initial value problem

$$\frac{dy}{dx} = \frac{y}{x+y}, \quad y(1) = 2.$$

(a) Using Euler's method with a step size of .1, estimate  $y(1.2)$ .

(b) Estimate the local truncation error that occurred in the first step of part (a).

2. Consider the differential equation

$$\frac{dy}{dx} = f(y)$$

where the graph of  $f$  is shown below:

- (a) Identify (approximately) the equilibrium solutions of  $f$  and indicate whether each is stable, unstable or semistable.
- (b) What is  $\lim_{x \rightarrow \infty} y(x)$  if  $y(0) = 1$ ? if  $y(0) = -1$ ?