## **Euler's Method Exercises** Math 112

1. Suppose that y is a function of x whose derivative is given by  $y' = \frac{y}{x^2}$  and that  $y = -\frac{1}{2}$  when x = 1. Use Euler's method with  $\Delta x = .1$  to approximate the value of y when x = 2. Fill in the table below with the appropriate values and plot a graph of your results.

Old point		slope at old point	Change in y	new x	new y
old x	old y	y '(old point)	$\Delta y = \mathbf{slope} \cdot \Delta x$	<b>old</b> $x + \Delta x$	old $y + \Delta y$

2. Suppose that y is a function of t whose derivative is given by  $y' = 3y^2$  and that y = -1 when t = 0. Use Euler's method with  $\Delta t = \frac{1}{2}$  to approximate the value of y when t = 3. Then take  $\Delta t = -\frac{1}{2}$  and approximate the value of y when t = -3.

Old point		slope at old point	Change in y	new t	new y
old t	old y	y '(old point)	$\Delta y = slope \cdot \Delta t$	old $t + \Delta t$	old $y + \Delta y$