Math 31L Quiz #2 (Lab 4, Part 1)

Blake, Fall 1995

Name_____

The diagram to the right shows an Euler's Method approximation of the curve $y(t)$, where we have assumed that $\frac{dy}{dt} = -2t - 4$ and where we have taken $\Delta t = .25$. The points that were plotted are labeled p_0, p_1, p_2, p_3, and p_4 for reference.
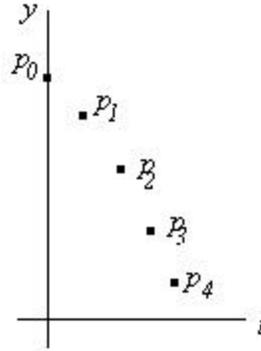
1. (5 points) What is the slope of the line connecting p_2 and p_3? Show your work.

2. (5 points) What is the "rise" of the line connecting p_2 and p_3? Show your work.

3. (5 points) If we recomputed this approximate curve with a smaller value of Δt, would the new approximating graph lie above or below the one drawn above? Explain your answer.

4. (5 points) Assume that $(t_0,\ y_0) = (0,\ 2)$ and $\frac{dy}{dt} = \frac{1}{t+1}$. Suppose that we use Euler's Method with $\Delta t = \frac{1}{2}$ to approximate the solution of this differential equation. Compute the coordinates, $(t_2,\ y_2)$, of the third point in Euler's approximation.