MM2 – Chapter 9 – Section 2

Pre-Class Question:

If you know the following,

$$\frac{d}{dx}(y') = 0$$

What can you tell me about y?

Class Worksheet

1. Prove:

$$\int \sqrt{1 + y'^2}\, dx = \int \sqrt{1 + x'^2}\, dy$$

2. Consider the index of refraction goes as the $1/r^2$ in polar coordinates. Find a differential equation that minimizes the path.
3. Minimize the path:

$$\int_{x_1}^{x_2} y^{3/2} ds$$

4. Solve the following differential equation in Matlab

$$y' = 4y$$

Where y(0) = 1