

Math 205

Quiz #5

1. Solve the given differential equation

$$\frac{dy}{dx} = (1 - 2x)y^2,$$

$$y(0) = -\frac{1}{6}.$$

$$\Rightarrow \int_{-\frac{1}{6}}^y \frac{1}{y^2} dy = \int_0^x (1 - 2x) dx$$

$$\Rightarrow -\frac{1}{y} \Big|_{-\frac{1}{6}}^y = x - x^2$$

$$\Rightarrow -\frac{1}{y} - 6 = x - x^2$$

$$\Rightarrow \frac{1}{y} = x^2 - x - 6$$

$$\Rightarrow y = \frac{1}{x^2 - x - 6}.$$