

Differential Equations – Day 3 In Class

Professor:

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For each of the following problems:

1. Talk about the existence and uniqueness of solutions. Are there any initial conditions for which we would have problems? Why or why not?
2. Solve the problem for a general solution using separation and say why you can't just integrate.

GROUP 1

$$y \frac{dy}{dx} = x - 1$$

GROUP 2

$$\frac{dv}{dt} = -3\sqrt{v}$$

GROUP 3

$$\frac{dy}{dx} = 3\sqrt{xy}$$

GROUP 4

$$\frac{dv}{dt} = 4t^3v - v$$