

Lecture 14: February 3, 2016

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14.1 Separable Differential Equations

A 1st order separable DE is a DE that can be written as $\frac{dy}{dx} = g(x)f(x)$

Example 14.1

$$\frac{dy}{dx} = x \sin x \leftarrow \text{is separable}$$

$$\frac{dy}{dx} - y = ye^x \leftarrow \text{is separable as } \frac{dy}{dx} = y(e^x + 1)$$

$$\frac{dx}{dt} = t + x \leftarrow \text{is not separable}$$

How to solve a separable DE :

Have $\frac{dy}{dx} = g(x)f(x)$

1. Rewrite as $\frac{dy}{f(y)} = g(x)dx$
2. Integrate both sides $\int \frac{dy}{f(y)} = \int g(x)dx$

Note : In Step 1 we assume $f(y) \neq 0$, but it still may be a solution to the DE

Today's note was short as we did a lot of examples in class instead of covering new material.

End of Lecture Notes
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