

# What does it mean to solve a DE?

Wednesday, February 21, 2018 10:25 AM

recall from Math 191:

Find the function  $y = f(x)$ , whose slope

$$\frac{dy}{dx} = x + 3$$

using our new terminology:

$$dy = (x+3) dx \quad \leftarrow \text{separable}$$

note: so integrate both sides, etc  
answer looked like  $y = \text{stuff in } x$

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this term: we are still doing the same question.

find  ~~$y = f(x)$~~  if the slope is  
the equation in  $x$  and  $y$

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

note: answer looks like  $\text{stuff in } y = \text{stuff in } x$