

Section 31.1: Solutions of

Wednesday, February 1, 2017 2:06 PM

Differential Equations DEs

differential equation \equiv an equation that contains derivatives or differentials

examples:

$$\frac{dy}{dx} = x^2 + 3$$

$$y'' + 3y' - 2y = x^2$$

jargon: if the equation contains only first derivatives, it's called a first-order DE

if the equation contains second derivatives, it's called second-order

\therefore the order of the equation = the order of the highest derivative in the equation

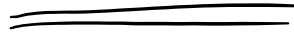
the degree of the equation = the highest power of the highest derivative

example:

$$\frac{d^2y}{dx^2} + 4 \left(\frac{dy}{dx} \right)^2 = 7$$

$$y'' + 4(y')^2 = 7$$

2nd order
1st degree



$$4 \left(\frac{dy}{dx} \right)^2 = 7$$

1st order (first deriv.)
2nd degree