Math 3B: Lecture 6

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- Quiz 1 will take place in discussion next week, at the beginning.

A differential equation is an equation that involves derivatives of an unknown function.

$$\frac{\mathrm{d}^2 y}{\mathrm{d}x^2} = y - 3y^2$$

or

$$x^2 y'' + xy' + x^2 y = 0$$

The force due to gravity is roughly $-10m$ Newtons, so

$$-10m = mh''(t)$$

A very rudimentary (but sometimes surprisingly accurate) way to model population growth is

Assumption

The rate of growth of a population is proportional to its current size

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If $P(t)$ is the population at time t:

$$\frac{\mathrm{d}P}{\mathrm{d}t} = rP(t)$$

$$\frac{\mathrm{d}y}{\mathrm{d}x} = f(x)$$

$$\frac{\mathrm{d}y}{\mathrm{d}x} = y(1-y)$$

$$y'' = \sqrt{a^2 - (y')^2}$$

$$\frac{\mathrm{d}y}{\mathrm{d}t} = k(A-y)^2$$