Calc AB

Notes 6.3 Separation of Variables

Read Intro p.423

> A function $f(x, y)$ is a homogeneous function of degree n if
> $$f(tx, ty) = t^n f(x, y)$$
> where n is any real number.

To test if a function is homogeneous, replace each variable in the equation by t times that variable.
Replace x with tx, and y with ty.
Simplify completely.
Attempt to factor out all remaining t's as a Greatest Common Factor. (GCF)
If this is successful, then the function is homogeneous!

Read Example 4 p.423 for additional example

Ex1) Test each function to see if it is homogeneous:

a. $\left(x^2 + xy\right)dx + y^2 dy = 0$

b. $\left(x^2 + 1\right)dx + y^2 dy = 0$

Notes Continued with Newton's Law of Cooling