2.2 Seperable Differential Equations

A first order DE is seperable if it can be written as

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

$dy = f(x)(g(y))(dx)$

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

$\int \frac{dy}{g(y)} = \int f(x)\,dx$

Integration Techniques
* ① Parts
② Trig Sub
* ③ Partial Fractions
* ④ u sub
⑤ Tables
* ⑥ Trig Functions
⑦ Series

Ex) 1

$\frac{dy}{dx} = (x+1)^2$

$dy = (x+1)^2\,dx$

$\int dy = \int (x+1)^2\,dx$

$y = \frac{(x+1)^3}{3} + C$

Ex) 2

$\frac{dx}{dy} = (x+1)^2$

$\frac{dx}{(x+1)^2} = dy$

$\int (x+1)^{-2}\,dx = \int dy$

$\frac{(x+1)^{-1}}{-1} + C = y$

$y = \frac{-1}{(x+1)} + C$