Section 1.6

To Solve:

$2xyy' = x^2 + 2y^2, \text{Let } y = vx$

$(x - y) y' = x + y, y = vx$

$(x+y)y'=1, v=x+y$

Bernoulli's Equation

$x^2 y'+2xy=5y^4$

Exact Differential Equation

Criterion for exactness

Proof:

$$(4x - y)dx + (6y - x)dy = 0$$

$$\left(x + \tan^{-1} y\right)dx + \frac{x + y}{1 + y^2}dy = 0$$

Reducible Second Order Equations

$$y'' + 4y = 0$$

$$xy'' + y' = 4x$$