### 6.4 Exponential Growth and Decay

Ex 1)  Solve the initial value problem.

$$\frac{dy}{dx} = -\frac{x}{y}$$

$x = 4, y = 3$

Ex 2) Solve the initial value problem

$$\frac{dy}{dx} = 2xy$$

$x = 0, y = 3$

Ex3) Solve the initial value problem.

$$\frac{dy}{dx} = \cos^2 y \qquad\qquad x = 0, y = 0$$

Ex 4) Solve the initial value problem

$$\frac{dy}{dx} = e^{x-y} \qquad\qquad x = 0, y = 2$$

Ex 5) Solve the initial value problem

$$\frac{dy}{dx} = \frac{4\sqrt{y}\ \ln x}{x} \qquad x = e, y = 1$$

Ex 6) Find the solution to the differential equation
assuming k is a constant

$$\frac{dy}{dt} = ky \qquad k = -0.5, y(0) = 200$$

Ex 7) Find the solution to the differential equation assuming k is a constant

$$\frac{dy}{dt} = ky \qquad\qquad y(0) = 60, \, y(10) = 30$$