Assignment # 01

Q1. Form the differential equation

(i) $A\cos x + B\sin x$

(ii) $y^2 = Ax^2 + Bx + C$

Q2. Solve the following first order differential equations.

(i) $\frac{dy}{dx} = \frac{x(2\log x + 1)}{\sin y + y\cos y}$

(ii) $\cos(x+y)dy = dx$

(iii) $(2xy + x^2)\frac{dy}{dx} = 3y^2 + 2xy$

(iv) $(x^2 + 3xy + y^2)dx - x^2 dy = 0$

(v) $\frac{dy}{dx} = -\frac{4x + 3y + 15}{2x + y + 7}$

(vi) $(2xy\cos x^2 - 2xy + 1)dx + (\sin x^2 - x^2 + 3)dy = 0$

(vii) $e^x dx + (e^x \cot y + 2y\operatorname{cscy})dy = 0$

(viii) $(x^3 - x)\frac{dy}{dx} - (3x^2 - 1)y = x^5 - 2x^3 + x$

(ix) $\frac{dy}{dx} - \frac{\tan y}{1+x} = (1+x)e^x \sec y$

(X) $\frac{dy}{dx} + \frac{y}{2x} = \frac{x}{y^3}$ $\quad y(1) = 2$