1. Solve the following 1st order DE

(a) $2x\frac{dy}{dx}+3y=4$ (16 scores)

(b) $\cos x - y\sin x + (1+\cos x)\frac{dy}{dx}=0$ (17 scores)

(c) $t^2\frac{dy}{dx}+y^2=ty$ (17 scores)

2. Solve the following higher order DEs

(a) $(1-2x-x^2)y''(x)+2(1+x)y'(x)-2y(x)=0$ (16 scores)

(Hint: $y=x+1$ is one of the solutions)

(b) $y^{(4)}(x)+2y^{(3)}(x)+y''(x)-2y'(x)-2y(x)=1+e^x$ (17 scores)

(c) $xy''(x)-y'(x)=\ln(x^2)$ (17 scores)