Assignment 2 : Mathematics Paper

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Q.1 Solve the following:

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

b. $(2\cos y+4x^2)dx-x\sin ydy==0$

Q.2 Find a homogeneous linear second order ordinary differential equation whose solution is the set of all straight lines in the xy-plane.

Q.3)State whether the following differential equations are linear or non linear ,justify and solve:

a.$xy'+2y=\frac{e^{3x}}{x}, x>0 with y(1)=1+\frac{e^3}{3}$. (b)$x^2y\frac{dy}{dx}-xy^2=1$

Q.4 If x^2 and 1 are solutions of $yy''-xy'=0$ then so is any linear combination of these. State true or false and justify.

Q.5 Find a linear ordinary differential equation for which the function $e^{-x}\cos 2x$ and $e^{-x}\sin 2x$ are linearly independent solutions.

Q.6 Find solution of x :

$$\begin{bmatrix} 1 & 1 & 1 \\ x^2 & x^3 & x^4 \\ x^3 & x^4 & x^5 \end{bmatrix}$$