Differential Equations **Worksheet 3** Name:

1. Solve the following DEs by partial integration.

   (a) $(2x-1)dx + (3y+7)dy = 0$

   (b) $(5x+4y)dx + (4x-8y^3)dy = 0$

   (c) $(\sin y - y\sin x)dx + (\cos x + x\cos y - y)dy = 0$

   (d) $(\tan y - 3x^2)dx + x\sec^2 y dy = 0$

   (e) $(y^2e^{xy}+1)dx + (xye^{xy}+e^{xy})dy = 0$

2. Solve the following non exact differential equations by integration factor.

   (a) $(x^5+3y)dx - xdy = 0$

   (b) $(xy+1)ydx + (2y-x)dy = 0$

   (c) $(y^2+xy^3)dx + (5y^2 - xy + y^3\sin y)dy = 0$

   (d) $(10-6y+e^{-3x})dx - 2dy = 0$

3. Solve the following IVP.

$$\begin{cases} xdx + (x^2y+4y)dy & = 0 \\ y(4) & = 0 \end{cases}$$

4. Solve the following IVP.

$$\begin{cases} (x^2+y^2-5)dx & = (y+xy)dy \\ y(0) & = 1 \end{cases}$$