$$(e^x \sin y - 2y\sin x)dx + (e^x\cos y + 2\cos x)dy = 0$$ (3

$$\begin{cases} P_{(x,y)} = e^x \sin y - 2y \sin x & \rightarrow \quad \dfrac{\partial P}{\partial y} = e^x \cos y - 2\sin x \\ Q_{(x,y)} = e^x \cos y + 2\cos x & \rightarrow \quad \dfrac{\partial Q}{\partial x} = e^x \cos y - 2\sin x \end{cases} \quad => \quad \frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x} \quad => \quad exact$$

מש' דיפרנציאלית מדוייקת!

$$P(x,y)\,dx + Q(x,y)\,dy = 0$$

$$\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x}$$ תנאי לכך מדוייקת:

הפתרון: $$\int_{x_0}^{x} P(x,y)\,dx + \int_{y_0}^{y} Q(x_0,y)\,dy = 0$$

$$\int_{x_0}^{x} (e^x \sin y - 2y \sin x)\,dx + \int_{y_0}^{y} (e^{x_0} \cos y + 2\cos x_0)dy = 0$$

$$[e^x \sin y + 2y\cos x \Big|_{x_0}^{x} + [e^{x_0} \sin y + 2\cos x_0\, y \Big|_{y_0}^{y} = 0$$

$$e^x \sin y + 2y\cos x - e^{x_0}\sin y - 2y\cos x_0 + e^{x_0}\sin y + 2\cos x_0\, y - e^{x_0}\sin y_0 + 2\cos x_0\, y_0 = 0$$

$$e^x \sin y + 2y\cos x - e^{x_0}\sin y_0 + 2\cos x_0\, y_0 = 0 \quad =>$$

$$e^x \sin y + 2y\cos x = C$$