1. Find \( \frac{dy}{dx} \) of \(-5e^y \sin(5x) = -5y - 7xy\) via implicit differentiation.

**Solution:** \( \frac{dy}{dx} \) can be found by \( \frac{dy}{dx} = -\frac{F_x}{F_y} \). Where \( F_x \) and \( F_y \) are the partial derivatives of a function which equals zero.

To find such a function, \( F \), add \( 5y + 7xy \) to both sides of the equation, resulting in:

\[
F(x, y) = -5e^y \sin(5x) + 5y + 7xy = 0
\]

Now, let us take the partials of this function.

\[
F_x = -25e^y \cos(5x) + 7y = 0
\]
\[
F_y = -5e^y \sin(5x) + 5 + 7x = 0
\]

Therefore:

\[
\frac{dy}{dx} = -\frac{-25e^y \cos(5x) + 7y}{-5e^y \sin(5x) + 5 + 7x}
\]