Find the derivative

$$e^{x+y} = x + y$$

Solution:

$$\frac{d(e^{x+y})}{dx} = \frac{d(x+y)}{dx}$$

$$e^{x+y} * \left(\frac{d}{dx}(x+y)\right) = \frac{dx}{dx} + \frac{dy}{dx}$$

$$e^{x+y} * \left(\frac{dx}{dx} + \frac{dy}{dx}\right) = \frac{dx}{dx} + \frac{dy}{dx}$$

$$e^{x+y} * \left(1 + \frac{dy}{dx}\right) = 1 + \frac{dy}{dx}$$

$$e^{x+y} + (e^{x+y})\frac{dy}{dx} = 1 + \frac{dy}{dx}$$

$$(e^{x+y})\frac{dy}{dx} - \frac{dy}{dx} = 1 - e^{x+y}$$

$$(e^{x+y} - 1)\frac{dy}{dx} = 1 - e^{x+y}$$

$$\frac{dy}{dx} = \frac{1 - e^{x+y}}{e^{x+y} - 1}$$

$$\frac{dy}{dx} = -1$$

Answer: $\mathbf{-1}$