As a hint, solution to an indirect definite integral is provided.

$$\int \mathrm{e}^{x} \sin(x)\, dx$$

Solution Take e^x as the first function and $\sin x$ as the second function. Then, integrating by parts, we have

$$\mathrm{I} = \int \mathrm{e}^{x} \sin(x)\, dx = \mathrm{e}^{x}(-\cos(x) + \int \mathrm{e}^{x} \cos(x)\, dx$$

$$= -\mathrm{e}^{x} \cos(x) + I_1(say)$$

Take e^x and $\cos(x)$ as the first and second functions, respectively, in I_1. Then, solving I_1 , we get

$$\mathrm{I} = \mathrm{e}^{x} \sin(x) - \int \mathrm{e}^{x} \sin(x)\, dx$$

Substituting the value of I_1 in I, we get

$$\mathrm{I} = -\mathrm{e}^{x} \cos(x) + \mathrm{e}^{x} \sin(x) - I$$

which can be written as,

$$2\mathrm{I} = \mathrm{e}^{x}(\sin x - \cos x)$$

Hence,

$$\mathrm{I} = \int \mathrm{e}^{x} \sin(x)\, dx = \frac{\mathrm{e}^{x}}{2}(\sin(x) - \cos(x)) + C$$

Alternatively, above integral can also be determined by taking $\sin(x)$ as the first function and e^x as the second function.