

INTEGRATION BY PARTS

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Name: Solutions

1. Evaluate

$$\int e^x \cos(x) dx$$

$$u = \cos(x)$$

$$v = e^x$$

$$du = -\sin(x) dx$$

$$dv = e^x dx$$

$$\int e^x \cos(x) dx = e^x \cos(x) + \int e^x \sin(x) dx$$

$$u = \sin(x) \quad v = e^x$$
$$du = \cos(x) dx \quad dv = e^x dx$$

$$= e^x \cos(x) + e^x \sin(x) - \int e^x \cos(x) dx$$

$$\Rightarrow 2 \int e^x \cos(x) dx = e^x \cos(x) + e^x \sin(x) + C$$

$$\Rightarrow \int e^x \cos(x) dx = \frac{e^x \cos(x) + e^x \sin(x)}{2} + C$$