

## Application of integration by parts (twice) 2

Alan Windsor

October 21, 2020

Complete the following integrals by using integration by parts twice. Use the Geogebra App to check your answers.

1.  $\int e^x \sin x \, dx$

2.  $\int e^x \cos x \, dx$

3.  $\int e^{2x} \sin x \, dx$

4.  $\int e^x \cos 2x \, dx$

5.  $\int e^{2x} \cos 2x \, dx$

6.  $\int e^{4x} \sin 4x \, dx$

Evaluate the following definite integrals. Use the Geogebra App to check your answers.

$$1. \int_{\pi/2}^{\pi} e^x \sin x \, dx \qquad \text{Answer} \quad \left[ \frac{e^{\pi/2}}{2} (e^{\pi/2} - 1) \right]$$

$$2. \int_0^{\pi/2} e^x \cos x \, dx \qquad \text{Answer} \quad \left[ \frac{1}{2} (e^{\pi/2} - 1) \right]$$

$$3. \int_0^{\pi/2} e^{2x} \sin x \, dx \qquad \text{Answer} \quad \left[ \frac{2e^{\pi} + 1}{5} \right]$$

$$4. \int_0^{\pi} e^x \cos 2x \, dx \qquad \text{Answer} \quad \left[ \frac{e^{\pi} - 1}{5} \right]$$

$$5. \int_0^{\pi/8} e^{2x} \cos 2x \, dx \qquad \text{Answer} \quad \left[ \frac{1}{4} (\sqrt{2} e^{\pi/4} - 1) \right]$$

$$6. \int_{\pi/16}^{\pi/8} e^{4x} \sin 4x \, dx \qquad \text{Answer} \quad \left[ \frac{e^{\pi/2}}{8} \right]$$