

Calculus 1B - Integration by Parts

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Compute the following integrals using integration by parts:

(1)

$$\int x \cos x \, dx$$

(2)

$$\int \sin^{-1} x \, dx$$

(3)

$$\int x^m \ln x \, dx, \quad m \neq -1$$

(4)

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

(5) Find the area of the region bounded by the curves

$$y = 7 \ln x, \quad y = x \ln x$$

(6) Compute the average value of the function $y = e^{-x} \cos x$ on the interval $[0, \pi/2]$.