

The following problems are extra problems for practicing integration by parts.

Problem 1: $\int \cos^\alpha(x) dx = \frac{\cos^{\alpha-1}(x) \sin(x)}{\alpha} + \frac{\alpha-1}{\alpha} \int \cos^{\alpha-2}(x) dx$

Problem 2: $\int \cos^\alpha(\beta x) dx = \frac{\cos^{\alpha-1}(\beta x) \sin(\beta x)}{\alpha\beta} + \frac{\alpha-1}{\alpha} \int \cos^{\alpha-2}(\beta x) dx$

Problem 3: $\int x^\alpha \ln(x) dx = \frac{x^{\alpha+1}}{\alpha+1} \ln(x) - \frac{x^{\alpha+1}}{(\alpha+1)^2} + C$

Problem 4: $\int \arctan(1/t) dt$