

Exercises 7.2, Mathematics 1 (12-PHY-BIPMA1)
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1. Compute

$$(a) \int \sinh x dx, \quad (b) \int \cosh x dx, \quad (c) \int \tanh x dx, \quad (d) \int \coth x dx.$$

2. Use substitutions to compute the following indefinite integrals:

$$(a) \int (x+1)^2 dx, \quad (b) \int x \sin(x^2) dx, \quad (c) \int \frac{x^3 dx}{x^2+1}, \quad (d) \int x^2 e^{-x^3} dx,$$
$$(e) \int \frac{dx}{x \ln x}, \quad (f) \int \frac{e^{\arccos x}}{\sqrt{1-x^2}} dx, \quad (g) \int \frac{dx}{\sin x}.$$

3. Use integration by parts to compute the following indefinite integrals:

$$(a) \int \ln x dx, \quad (b) \int x^2 e^x dx, \quad (c) \int x \sin x dx, \quad (d) \int \arcsin^2 x dx,$$
$$(e) \int e^{\alpha x} \sin(\beta x) dx, \text{ for any } \alpha, \beta \in \mathbb{R}, \quad (f) \int x^n \ln x dx, \text{ for any } n \in \mathbb{N}.$$