

## Übungsblatt 4 : Partielle Integration

1.  $\int x \cos(x) \, dx$

9.  $\int_0^1 x e^{-x} \, dx$

2.  $\int_0^{\frac{\pi}{2}} x \sin(x) \, dx$

10.  $\int \sqrt{x} \ln(x) \, dx$

3.  $\int x e^x \, dx$

11.  $\int_1^{\ln(2)} x^2 e^x \, dx$

4.  $\int_1^e x \ln(x) \, dx$

12.  $\int_{\frac{1}{4}}^{\frac{e}{4}} (x+1) \cdot \ln(4x) \, dx$

5.  $\int x^2 \sin(x) \, dx$

13.  $\int \ln(x) \, dx$

6.  $\int (3x-5) e^{2x} \, dx$

14.  $\int_0^5 \frac{x}{\sqrt{x+4}} \, dx$

7.  $\int_0^3 x \cdot \sqrt{1+x} \, dx$

15.  $\int_{-1}^1 (x+1)(x-1)^7 \, dx$

8.  $\int x^2 \cos(1-x) \, dx$

16.  $\int \frac{x^2-1}{e^{2x}} \, dx$

Lösungen :

1.  $x \sin(x) + \cos(x) + k$

9.  $1 - \frac{2}{e}$

2.  $1$

10.  $\frac{2\sqrt{x^3}(3\ln(x)-2)}{9} + k$

3.  $(x-1)e^x + k$

11.  $2\ln^2(2) - 4\ln(2) - e + 4$

4.  $\frac{e^2+1}{4}$

12.  $\frac{e^2+17}{64}$

5.  $(2-x^2)\cos(x) + 2x\sin(x) + k$

13.  $x(\ln(x)-1) + k$

6.  $\frac{(6x-13)e^{2x}}{4} + k$

14.  $\frac{14}{3}$

7.  $\frac{116}{15}$

15.  $-\frac{64}{9}$

8.  $(2-x^2)\sin(1-x) + 2x\cos(1-x) + k$

16.  $-\frac{2x^2+2x-1}{4e^{2x}} + k$