

$$+ \frac{5}{6(x-3)} dx = \frac{7 \ln|x+3|}{6} + \frac{5 \ln|x-3|}{6} + C$$

$$+ C = \frac{7 \ln|x+3| + 5 \ln|x-3|}{6} + C$$

5. Integrationen

$$\int \cos^6(x) dx = \int \frac{(\cos(2x) + 1)^3}{8} dx = \begin{cases} u = 2x \\ \dot{x} = \frac{u}{2} \\ dx = \frac{1}{2} du \end{cases}$$

$$\frac{1}{8} \int \frac{(\cos(u) + 1)^3}{2} du = \frac{1}{16} \int \cos^3 u + 3 \cos^2 u + 3 \cos u + 1 du = \frac{1}{16} \left( \sin(u) - \frac{\sin^3 u}{3} + 3 \sin u + u \right) + C$$

$$= \frac{3 \sin(2u)}{64} - \frac{\sin^3(u)}{48} + \frac{\sin(u)}{4} + \frac{5u}{16} + C = \frac{3 \sin(4x)}{64} - \frac{\sin^3(2x)}{48} + \frac{\sin(2x)}{4} + \frac{5x}{16} + C$$

$$+ \frac{5x}{16} + C = \frac{3 \sin(4x)}{64} - \frac{\sin^3(2x)}{48} + \frac{\sin(2x)}{4} + \frac{5x}{16} + C$$

$$+ \frac{\sin(2x)}{4} + \frac{5x}{16} + C$$

$$\int_0^1 x dx + \int_0^1 xy^2 dy = \int_0^1 x dx + \int_0^1 xy^2 dy =$$



$$= \frac{1}{2} x^2 + \int x y^2 dy = \frac{x^2}{2} + x \int y^2 dy =$$

$$= \frac{x^2}{2} + \frac{x y^3}{3}$$

$$6 \int \cos^3 u + 3 \cos^2 u + 3 \cos u + 1 du =$$

$$= \frac{1}{16} \left( \sin(u) - \frac{\sin^3 u}{3} + \frac{\sin 2u}{4} + \frac{u}{2} \right)$$

$$\cdot 3 \sin u + 4 \Big) + \left( \frac{3 \sin(2u)}{64} - \frac{\sin^3(u)}{48} + \right.$$

$$\left. + \frac{\sin(u)}{4} + \frac{5u}{32} + C = \frac{3 \sin(4x)}{64} - \frac{\sin(2x)}{48} + \frac{\sin(2x)}{4} + \frac{5x}{16} + C \right.$$

6. Trapezium

$$y = 5x - x^2$$

$$y = 5 - x$$

$$S = \int_a^b (f_2(x) - f_1(x)) dx$$

$$S = \int_1^5 (-5 + 6x - x^2) dx = \frac{32}{3}$$

7. Trapezium

$$y = \frac{1}{n} \sin x$$

$$\text{von } x = \frac{\pi}{3} \text{ zu } x = \frac{\pi}{2}$$