

S 101 Nr. 2

$$a) f(x) = \frac{5}{x} = 5 \cdot \frac{1}{x} ; \underline{\underline{F(x) = 5 \cdot \ln(|x|)}}$$

$$b) f(x) = 3 \cdot \frac{1}{(x+5)} ; F(x) = 3 \cdot \ln(|x+5|)$$

$$c) f(x) = -\frac{1}{2} \cdot \frac{1}{x} ; \underline{\underline{F(x) = -\frac{1}{2} \cdot \ln(|x|) + C}} \text{ für } C = -\frac{\ln(2)}{2}$$

$$F(x) = -\frac{1}{2x} ; F(x) = -1 \cdot \ln(|2x|) \cdot \frac{1}{2} = -\frac{1}{2} \cdot \ln(|2x|)$$

$$d) f(x) = \frac{1}{(2x-3)} ; F(x) = \ln(|2x-3|) \cdot \frac{1}{2} = \frac{1}{2} \cdot \ln(|2x-3|)$$

S 101 Nr. 3

$$a) \int_0^2 (2+x)^3 dx = \left[\frac{(2+x)^4}{4} \right]_0^2 = \frac{(2+2)^4}{4} - \frac{(2+0)^4}{4} = \frac{240}{4} = \underline{\underline{60}}$$

$$b) \int_2^3 \left(1 + \frac{1}{x^2}\right) dx = \left[x - \frac{1}{x} \right]_2^3 = 3 - \frac{1}{3} - \left\{ 2 - \frac{1}{2} \right\} = \underline{\underline{\frac{7}{6}}}$$

$$c) \int_0^2 \frac{1}{(x+1)^2} dx = \left[\frac{-1}{(x+1)^1} \right]_0^2 = -\frac{1}{2+1} - \left\{ \frac{-1}{0+1} \right\} = \underline{\underline{\frac{2}{3}}}$$

$$d) \int_0^9 \frac{2}{5} \sqrt{x} dx = \int_0^9 \frac{2}{5} \cdot (x)^{\frac{1}{2}} dx = \left[\frac{2}{5} \cdot x^{\frac{3}{2}} \cdot \frac{1}{\frac{3}{2}} \right]_0^9 = \left[\frac{2}{5} \cdot \frac{2}{3} \cdot x^{\frac{3}{2}} \right]_0^9$$
$$= \left[\frac{4}{15} \cdot (\sqrt{x})^3 \right]_0^9 = \frac{4}{15} \cdot (\sqrt{9})^3 - \left\{ \frac{4}{15} \cdot (\sqrt{0})^3 \right\} = \underline{\underline{\frac{36}{5}}}$$

$$e) \int_{-0,5}^0 e^{2x+1} dx = \left[e^{2x+1} \cdot \frac{1}{2} \right]_{-0,5}^0 = \left[\frac{1}{2} \cdot e^{2x+1} \right]_{-0,5}^0$$

$$= \frac{1}{2} \cdot e^{2 \cdot 0 + 1} - \left\{ \frac{1}{2} \cdot e^{2 \cdot (-\frac{1}{2}) + 1} \right\} = \frac{1}{2} \cdot e^1 - \frac{1}{2} \cdot e^0$$
$$= \underline{\underline{\frac{1}{2} \cdot (e - 1) \approx 0,859}}$$