1.

    a) $-\dfrac{1}{2}\sqrt{1-x^4}$ b) $2\ln(x-1)+2\ln(x+1)-\ln x$

    c) $\dfrac{1}{2}((x^2+1)\arctan(x)-x)$ d) $\dfrac{1}{3}x^3+\dfrac{3}{2}x^2+9x+\dfrac{82}{3}\ln(x-3)+\dfrac{5}{3}\ln(x+3)$

2. Kreis 1: $x^2+y^2=16$,   Kreis 2: $x^2+(y-5)^2=9$

   Schnittpunkte: $y=16/5$, $x=\pm 12/5$

$$\text{Fläche} = 2\left(\int_0^{12/5}\sqrt{16-x^2}-(5-\sqrt{9-x^2})\,dx\right) = -12+16\arcsin\left(\frac{3}{5}\right)+9\arcsin\left(\frac{4}{5}\right)\approx 6{,}64167$$

3. $\sin(\pi/4)=\cos(\pi/4)=1/\sqrt{2}$

$$\text{Fläche} = \int_{\pi/4}^{5\pi/4}(\sin x-\cos x)\,dx = 4/\sqrt{2}$$

4.

$$\text{Vol} = \pi\int_0^{\pi/2}e^{-2x}\sin x\,dx = \frac{\pi}{5}(1-2e^{-\pi})\approx 0{,}574$$