

omgave 2:

$$\begin{aligned} \text{a) } \int_0^1 x^2 + \sqrt{x} + 2x \, dx &= \left[ \frac{1}{3}x^3 + \frac{2}{3}x^{\frac{3}{2}} + x^2 \right]_0^1 \\ &= \frac{1}{3} + \frac{2}{3} + \frac{3}{3} = \underline{\underline{2}} \end{aligned}$$

$$\begin{aligned} \text{b) } \int_{-1}^1 \frac{e^x - e^{-x}}{2} \, dx &= \frac{1}{2} \int_{-1}^1 e^x - e^{-x} \, dx \\ &= \frac{1}{2} [e^x + e^{-x}]_{-1}^1 = \cancel{\frac{1}{2} [e^1 + e^{-1} - e^{-1} - e^1]} \\ &= \frac{1}{2} (e^1 + e^{-1} - e^{-1} - e^1) = \underline{\underline{0}} \end{aligned}$$

$$\begin{aligned} \text{c) } \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} f(x) \, dx, \quad f(x) &= \begin{cases} \sin(x), & x \leq 0 \\ 4x, & x > 0 \end{cases} \\ \int_{-\frac{\pi}{2}}^0 \sin(x) \, dx + \int_0^{\frac{\pi}{2}} 4x \, dx &= [-\cos(x)]_{-\frac{\pi}{2}}^0 + [2x^2]_0^{\frac{\pi}{2}} \end{aligned}$$

$$(-\cos(0) + \cos(\frac{\pi}{2})) + (2 \cdot (\frac{\pi}{2})^2 + 0) \approx \underline{\underline{3.935}}$$