

HW §6.1 Numbers 2,6,14,22

2.

$$\begin{aligned} A &= \int_0^2 \left( \sqrt{x+2} - \frac{1}{x+1} \right) dx \\ &= \frac{2}{3} (x+2)^{3/2} - \ln|x+1| \Big|_0^2 \\ &= \frac{2}{3} (4)^{3/2} - \ln 3 - \frac{2}{3} (2)^{3/2} \end{aligned}$$

6.

$$\begin{aligned} A &= \int_0^{\pi/2} (e^x - \sin x) dx \\ &= e^x + \cos x \Big|_0^{\pi/2} \\ &= e^{\pi/2} - 2 \end{aligned}$$

14.

$$\begin{aligned} A &= \int_{-2}^0 ((x^3 - x) - 3x) dx + \int_0^2 (3x - (x^3 - x)) dx \\ &= \left( \frac{1}{4} x^4 - 2x^2 \Big|_{-2}^0 \right) + \left( 2x^2 - \frac{1}{4} x^4 \Big|_0^2 \right) \\ &= 8 \end{aligned}$$

22.

$$\begin{aligned} A &= \int_0^{\pi/3} (\sin 2x - \sin x) dx + \int_{\pi/3}^{\pi/2} (\sin x - \sin 2x) dx \\ &= (\sin^2 x + \cos x) \Big|_0^{\pi/3} + (-\cos x - \sin^2 x) \Big|_{\pi/3}^{\pi/2} \\ &= \frac{3}{2} \end{aligned}$$