

Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Β

32.1 1)

$$E = \int_2^4 |f(x)| dx = \int_2^4 |x| dx \stackrel{x>0}{=} \int_2^4 x dx = \left[\frac{x^2}{2} \right]_2^4 = \frac{4^2}{2} - \frac{2^2}{2} = \boxed{6}$$

32.1 2)

$$\begin{aligned} E &= \int_{-5}^{-1} |f(x)| dx = \int_{-5}^{-1} |2x| dx \stackrel{2x<0}{=} \int_{-5}^{-1} -2x dx = \left[-x^2 \right]_{-5}^{-1} = -\left[x^2 \right]_{-5}^{-1} = \\ &= -\left[(-1)^2 - (-5)^2 \right] = -(1 - 25) = 24 \end{aligned}$$

32.1 3)

$$\begin{aligned} E &= \int_{-1}^2 |f(x)| dx = \int_{-1}^2 |x^2 + 1| dx \stackrel{x^2+1>0}{=} \int_{-1}^2 (x^2 + 1) dx = \left[\frac{x^3}{3} + x \right]_{-1}^2 = \\ &= \frac{2^3}{3} + 2 - \left(\frac{(-1)^3}{3} - 1 \right) = \frac{8}{3} + 2 + \frac{1}{3} + 1 = 6 \end{aligned}$$

32.1 4)

$$E = \int_0^{\ln 2} |f(x)| dx = \int_0^{\ln 2} |e^x| dx \stackrel{e^x>0}{=} \int_0^{\ln 2} e^x dx = \left[e^x \right]_0^{\ln 2} = e^{\ln 2} - e^0 = 2 - 1 = 1$$

32.1 5)

$$E = \int_0^{\frac{\pi}{2}} |f(x)| dx = \int_0^{\frac{\pi}{2}} |\eta \mu x| dx \stackrel{\eta \mu x > 0}{=} \int_0^{\frac{\pi}{2}} \eta \mu x dx = \left[-\sigma \nu x \right]_0^{\frac{\pi}{2}} = -\sigma \nu \frac{\pi}{2} + \sigma \nu 0 = 1$$