

$$\begin{aligned}
 \therefore \text{Area} &= \int_{-1}^3 (x^2 + 3x + 2) dx \\
 &= \left. \frac{x^3}{3} + \frac{3x^2}{2} + 2x \right|_{-1}^3 \\
 &= \left( \frac{27}{3} + \frac{3(9)}{2} + 2(3) \right) - \left( \frac{-1}{3} + \frac{3}{2} + -2 \right) \\
 &= \frac{57}{2} - \frac{-5}{6} \\
 &= \boxed{\frac{176}{6}}
 \end{aligned}$$

**44** Find the area between the curve  $y = e^{-x}$  and the  $x$ -axis from  $x = -1$  and  $x = 1$ .

$$\begin{aligned}
 A &= \int_{-1}^1 e^{-x} dx \\
 &= \int_{-1}^1 -1 e^{-x} dx \\
 &= -1 e^{-x} \Big|_{-1}^1 = -e^{-1} - -e^1 \\
 &= -e^{-1} + e
 \end{aligned}$$