

S 154 Nr 9

$$\begin{aligned} \text{a)} \int_0^{\tilde{\pi}} (2 \sin(x) + 1) dx &= \left[ 2 \cdot (-\cos(x)) + x \right]_0^{\tilde{\pi}} = \left[ -2 \cos x + x \right]_0^{\tilde{\pi}} \\ &= -2 \cdot \cos(\tilde{\pi}) + \tilde{\pi} - \left[ -2 \cos(0) + 0 \right] = -2 \cdot (-1) + \tilde{\pi} - \left[ -2 \cdot (1) + 0 \right] \\ &= 2 + \tilde{\pi} + 2 = \underline{\underline{4 + \tilde{\pi}}} \end{aligned}$$

$$\begin{aligned} \text{b)} \int_0^{4\tilde{\pi}} (-\sin(x) - 2) dx &= \left[ +\cos(x) - 2x \right]_0^{4\tilde{\pi}} = \cos(4\tilde{\pi}) - 2 \cdot 4\tilde{\pi} - \cos(0) \\ &= 1 - 8\tilde{\pi} - 1 = \underline{\underline{-8\tilde{\pi}}} \end{aligned}$$

$$\begin{aligned} \text{c)} \int_0^{\frac{\tilde{\pi}}{2}} 3 \cdot \sin(2x) dx &= \left[ 3 \cdot (-\cos(2x)) \cdot \frac{1}{2} \right]_0^{\frac{\tilde{\pi}}{2}} = \left[ -\frac{3}{2} \cos(2x) \right]_0^{\frac{\tilde{\pi}}{2}} \\ &= -\frac{3}{2} \cos\left(2 \cdot \frac{\tilde{\pi}}{2}\right) - \left[ -\frac{3}{2} \cos(2 \cdot 0) \right] = -\frac{3}{2} \cdot (-1) + \frac{3}{2} \cdot 1 = \frac{6}{2} = \underline{\underline{3}} \end{aligned}$$

$$\text{d)} \int_0^{\tilde{\pi}} 3 \cos(x) dx = \left[ 3 \cdot \sin(x) \right]_0^{\tilde{\pi}} = 3 \cdot \sin(\tilde{\pi}) - 3 \sin(0) = 0 - 0 = \underline{\underline{0}}$$

$$\begin{aligned} \text{e)} \int_{-\tilde{\pi}}^0 3 \sin(0,5(x - \tilde{\pi})) dx &= \left[ -3 \cdot \cos(0,5(x - \tilde{\pi})) \cdot \frac{1}{0,5} \right]_{-\tilde{\pi}}^0 \\ &= \left[ -6 \cdot \cos(0,5(x - \tilde{\pi})) \right]_{-\tilde{\pi}}^0 = -6 \cdot \underbrace{\cos(0,5(0 - \tilde{\pi}))}_{=0} - \left[ -6 \cdot \underbrace{\cos(0,5(-\tilde{\pi} - \tilde{\pi}))}_{=-1} \right] \\ &= \underline{\underline{-6}} \end{aligned}$$

$$\begin{aligned} \text{f)} \int_{-\tilde{\pi}}^{\tilde{\pi}} (-5 \cos(3x) + x) dx &= \left[ -5 \cdot \sin(3x) \cdot \frac{1}{3} + \frac{x^2}{2} \right]_{-\tilde{\pi}}^{\tilde{\pi}} = \\ &= -\frac{5}{3} \cdot \underbrace{\sin(3\tilde{\pi})}_{=0} + \frac{\tilde{\pi}^2}{2} - \left[ -\frac{5}{3} \cdot \underbrace{\sin(3 \cdot (-\tilde{\pi}))}_{=0} + \frac{(-\tilde{\pi})^2}{2} \right] = +\frac{\tilde{\pi}^2}{2} - \frac{\tilde{\pi}^2}{2} = \underline{\underline{0}} \end{aligned}$$