

S 101 Nr. 3

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

$$\begin{aligned}
 g.) \int_{-1}^1 \frac{1}{5} e^{\frac{1}{2}x} dx &= \left[\frac{1}{5} \cdot e^{\frac{1}{2}x} \cdot \frac{1}{\frac{1}{2}} \right]_{-1}^1 = \left[\frac{2}{5} \cdot e^{\frac{1}{2}x} \right]_{-1}^1 = \\
 &= \frac{2}{5} \cdot e^{\frac{1}{2}} - \left\{ \frac{2}{5} \cdot e^{-\frac{1}{2}} \right\} = \frac{2}{5} \cdot (e^{\frac{1}{2}} - e^{-\frac{1}{2}}) \approx \underline{\underline{0,417}}
 \end{aligned}$$

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

S 101 Nr. 4

$$\begin{aligned}
 a.) \int_1^5 \frac{3}{x} dx &= 3 \cdot \int_1^5 \frac{1}{x} dx = \left[3 \cdot \ln(|x|) \right]_1^5 = 3 \cdot \ln(5) - 3 \cdot \underbrace{\ln(1)}_{=0} = \underline{\underline{3 \cdot \ln(5)}} \\
 &\approx \underline{\underline{4,828}}
 \end{aligned}$$

$$\begin{aligned}
 b.) \int_1^2 \left(1 + \frac{1}{x} \right) dx &= \left[1 \cdot x + \ln(|x|) \right]_1^2 = 2 + \ln(2) - \left\{ 1 + \underbrace{\ln(1)}_{=0} \right\} = \underline{\underline{1 + \ln(2)}} \\
 &\approx \underline{\underline{1,693}}
 \end{aligned}$$

$$\begin{aligned}
 c.) \int_3^4 \frac{1}{2(x+1)} dx &= \left[\frac{1}{2} \cdot \ln(|x+1|) \right]_3^4 = \frac{1}{2} \cdot \ln(4+1) - \left\{ \frac{1}{2} \cdot \ln(3+1) \right\} \\
 &= \frac{1}{2} (\ln(5) - \ln(4)) \approx \underline{\underline{0,112}}
 \end{aligned}$$

$$\begin{aligned}
 d.) \int_1^4 \frac{3}{(2x-1)} dx &= \left[3 \cdot \ln(|2x-1|) \cdot \frac{1}{2} \right]_1^4 = \left[\frac{3}{2} \cdot \ln(|2x-1|) \right]_1^4 \\
 &= \frac{3}{2} \cdot \ln(7) - \frac{3}{2} \ln(1) = \underline{\underline{\frac{3}{2} \cdot \ln(7)}} \approx \underline{\underline{2,919}}
 \end{aligned}$$