Nr. 4) a) $\int_0^2 (3x^2 - e^x)\,dx = \left[3\frac{x^3}{3} - e^x \right]_0^2 = \left[x^3 - e^x \right]_0^2$

$= 2^3 - e^2 - \{0^3 - e^0\} = 8 - e^2 + 1 = \underline{\underline{9 - e^2}}$

b) $\int_1^4 (\sqrt{x} - 1)\,dx = \int_1^4 (x^{\frac{1}{2}} - 1)\,dx = \left[\frac{x^{\frac{3}{2}}}{\frac{3}{2}} - x \right]_1^4$

$= \left[\frac{2}{3} x^{\frac{3}{2}} - x \right]_1^4 = \frac{2}{3} 4^{\frac{3}{2}} - 4 - \{ \frac{2}{3} \cdot 1^{\frac{3}{2}} - 1 \} = \frac{2}{3} \cdot 8 - 4 - \frac{2}{3} + 1$

$= \frac{14}{3} - 3 = \underline{\underline{\frac{5}{3}}}$

c) $\int_1^e \left(\frac{1}{x} + \frac{1}{x^2} \right) dx = \left[\ln(|x|) + \frac{x^{-1}}{-1} \right]_1^e = \ln(|e|) - \frac{1}{e} - \{ \ln(|1|) - 1 \}$

$= 1 - \frac{1}{e} - 0 + 1 = \underline{\underline{-\frac{1}{e} + 2}}$

d) $\int_0^{\pi} (\sin(x) + \cos(x))\,dx = \left[-\cos(x) + \sin(x) \right]_0^{\pi} =$

$= -\cos(\pi) + \sin(\pi) - \{ -\cos(0) + \sin(0) \} = 1 + 0 + 1 - 0 = \underline{\underline{2}}$

e) $\int_0^2 (2+x)^3\,dx = \left[\frac{(2+x)^4}{4} \cdot \frac{1}{1} \right]_0^2 = \frac{(2+2)^4}{4} - \left\{ \frac{(2+0)^4}{4} \right\}$

$= 64 - 4 = \underline{\underline{60}}$

f) $\int_2^3 \left(1 + \frac{1}{x^2} \right) dx = \left[x + \frac{1}{-x} \right]_2^3 = 3 - \frac{1}{3} - \{ 2 - \frac{1}{2} \}$

$= 3 - \frac{1}{3} - 2 + \frac{1}{2} = \frac{7}{6}$

Nr. 4)

g) $\int_1^5 \frac{3}{x}\,dx = \left[3\cdot \ln(|x|)\right]_1^5 = 3\cdot \ln(|5|) - \{3\cdot \ln(|1|)\}$

$= 3\cdot \ln(5) - 3\cdot 0 = \underline{\underline{3\cdot \ln(5)}}$

h) $\int_0^9 \left(\frac{2}{5}\sqrt{x}\right)dx = \int_0^9 \left(\frac{2}{5}\cdot x^{\frac{1}{2}}\right)dx = \left[\frac{2}{5}\cdot \frac{x^{\frac{3}{2}}}{\frac{3}{2}}\right]_0^9$

$= \left[\frac{2}{5}\cdot\frac{2}{3}\cdot \sqrt[2]{x^3}\right]_0^9 = \left[\frac{4}{15}\cdot \sqrt{x^3}\right]_0^9 = \frac{4}{15}\cdot 27 - \{0\} = \underline{\underline{\frac{36}{5}}}$

Nr. 5)

a) $\int_0^{\pi} \sin(3x-\pi)\,dx = \left[-\cos(3x-\pi)\cdot\frac{1}{3}\right]_0^{\pi} =$

$-\cos(2\pi)\cdot\frac{1}{3} - \{-\cos(3\cdot 0-\pi)\cdot\frac{1}{3}\} = -\frac{1}{3} - \frac{1}{3} = \underline{\underline{-\frac{2}{3}}}$

b) $\int_{-1}^{1}\left(\frac{1}{5}e^{\frac{1}{2}x}\right)dx = \left[\frac{1}{5}\cdot e^{\frac{1}{2}\cdot x}\cdot\frac{1}{\frac{1}{2}}\right]_{-1}^{1} = \left[\frac{2}{5}\cdot e^{\frac{1}{2}x}\right]_{-1}^{1}$

$= \frac{2}{5}\cdot e^{\frac{1}{2}} - \{\frac{2}{5}\cdot e^{-\frac{1}{2}}\} = \frac{2}{5}\cdot\sqrt{e} - \frac{2}{5}\cdot\frac{1}{\sqrt{e}} = \underline{\underline{\frac{2}{5}\cdot\left(\sqrt{e}-\frac{1}{\sqrt{e}}\right) \approx 0{,}417}}$

c) $\int_3^4 \frac{1}{2(x+1)}\,dx = \int_3^4 \frac{1}{2}(x+1)^{-1}dx = \left[\frac{1}{2}\ln(|x+1|)\right]_3^4 =$

$= \frac{1}{2}\cdot\ln(5) - \{\frac{1}{2}\cdot\ln(4)\} = \frac{1}{2}(\ln(5)-\ln(4)) = \underline{\underline{\frac{1}{2}\cdot\ln\left(\frac{5}{4}\right)}}$

d) $\int_1^4 \frac{3}{2x-1}\,dx = \left[3\cdot\ln(|2x-1|)\cdot\frac{1}{2}\right]_1^4 = \frac{3}{2}\cdot\ln(7) - \{\underbrace{\frac{3}{2}\cdot\ln(1)}_{=0}\}$

$= \underline{\underline{\frac{3}{2}\cdot\ln(7)}}$

O. Fell