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Nr. 3) $f(x) = \frac{1}{25}x^4$ $F(x) = \frac{1}{125}x^5$

a) $\int_1^5 \left(\frac{1}{25}x^4\right)dx = \left[\frac{1}{125}x^5\right]_1^5 = \frac{1}{125}\cdot 5^5 - \frac{1}{125}\cdot 1^5 = \frac{3124}{125}$

b) $f(x) = \frac{1}{x^2}$ $F(x) = -\frac{1}{x}$

$\int_1^5 \left(\frac{1}{x^2}\right)dx = \left[-\frac{1}{x}\right]_1^5 = -\frac{1}{5} - \left\{-\frac{1}{1}\right\} = \frac{4}{5}$

c) $f(x) = \cos(\pi \cdot x)$ $F(x) = \frac{1}{\pi}\cdot \sin(\pi x)$

$\int_1^5 (\cos(\pi x))\,dx = \left[\frac{1}{\pi}\cdot\sin(\pi x)\right]_1^5$

$= \frac{1}{\pi}\cdot\sin(5\pi) - \left\{\frac{1}{\pi}\cdot\sin(1\cdot\pi)\right\}$

$= \frac{1}{\pi}\cdot 0 - \frac{1}{\pi}\cdot 0 = 0$

d) $f(x) = \sin(x)\cdot\cos(x)$ $F(x) = \frac{1}{2}(\sin(x))^2$

$\int_1^5 (\sin(x)\cdot\cos(x))\,dx = \left[\frac{1}{2}\cdot(\sin(x))^2\right]_1^5$

$= \frac{1}{2}(\sin(5))^2 - \left\{\frac{1}{2}(\sin(1))^2\right\}$

$\approx \frac{1}{2}\cdot 0{,}9195 - \frac{1}{2}\cdot 0{,}7081 \approx 0{,}1057$

0. Fell