

**Solution** (#1340)

$$\begin{aligned}\int_0^\pi x \sin^2 x \, dx &= \frac{\pi^2}{4}. \\ \int_0^1 (x^2 + 1) \sinh x \cosh x \, dx &= \frac{3}{16}e^2 + \frac{7}{16}e^{-2} - \frac{3}{8}. \\ \int_0^\infty (2x^2 - 2)e^{-2x-3} \, dx &= -\frac{e^{-3}}{2}.\end{aligned}$$