Exercise(s) 7. 5. 2026

The last exercise is to be handed in at the beginning of the next lecture.

25. Explain the terms in the truncated normal form of degree 5 for the one-degree-of-freedom Hamiltonian

$$H(q,p) \;=\; \frac{p^2+q^2}{2} \;+\; \frac{q^3}{6}$$

using the splitting

$$\operatorname{im} X_{H_0^0} \;\oplus\; \ker X_{H_0^0} \;=\; \mathcal{G}_{k+2} \;.$$

26. Compute the normal forms of order 3 and 4 of

$$H(x,y) \;=\; \frac{y^2}{2} \;-\; \cos x$$

with respect to the linear part H_0^0 of H.