Digression (b): semiclassical limit "$\hbar \to 0$"

- **HOMEWORK:** Consider a classical Hamiltonian of the form

$$H = \frac{p^2}{2} - \frac{1}{z} + F z \cos(\omega t) \,. \tag{1}$$

  - Rescale (i.e., multiply) the energy of the Hamiltonian's time-independent part by a real scalar λ and define the associated scaled momentum, position, time, frequency, and amplitude (F) such that the classical Hamiltonian equations of motion remain form-invariant!
  - What happens to the commutator of the associated momentum and position operators, i.e. what is the commutation relation for the scaled momentum and position operators? Give an interpretation of that! Hence, what is the actual meaning of "$\hbar \to 0$"?
  - Where hides one of Kepler's laws?