2022年10月19日.

$$m\ddot{x} + \omega_0^2 (1 + h\cos\omega t)x = 0$$

$h \neq 0$, h很小.

例: $\varepsilon x^5 + ax^2 = b$

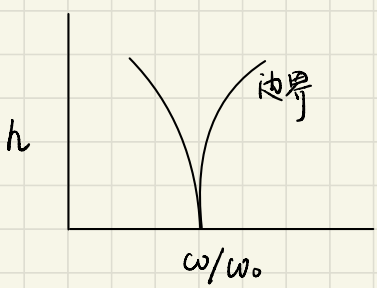
$\varepsilon \to 0$, 求解

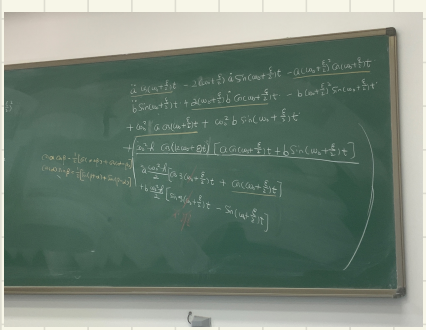
1) $\varepsilon = 0$. $ax^2 = b \Rightarrow x = \pm\sqrt{\frac{b}{a}}$

2) $\varepsilon \neq 0$. $x = \sqrt{\frac{b}{a}} + x_1\varepsilon + x_2\varepsilon^2 + \cdots$

微扰法(摄动法).

如果h为更加普适的情况,会在固体物理中讨论.





助教: 给出式279代入方程之后化简的代码. Coefficient [...]

作业: P86. 27.12 | 推导阻尼会缩小稳定区间这一结论,
以及其它相关的讨论,

习题2和3. [3求解到3阶. h^3].

非线性振动方程.

$$\ddot{x} + \omega_0^2 (1 + h\cos\omega t)\, x = 0$$

$$\ddot{x} + \omega_0^2 x + \alpha x^2 + \beta x^3 = 0 \quad \leftarrow \quad L = \frac{\dot{x}^2}{2} - \left(\frac{\omega_0^2}{2!} x^2 + \frac{\alpha}{3!} x^3 + \frac{\beta}{4!} x^4\right)$$