

Prob1:

(1)

$$\begin{aligned}54I_2 - 24I_4 - 12I_E &= 0 \\ -24I_2 + 36I_4 - 6I_E &= 0 \\ -12I_2 - 6I_4 + 18I_E &= 15 \\ I_5 &= I_4 - I_2\end{aligned}$$

(2) Gauss elimination, 圖中 I 的方向為正

Prob2:

(1) Euler's method, $h = 10^{-6}$, 向右為正

(2) $f = 1/T$

Prob3:

(a)

$$\frac{d}{dt} V(t) = g - \frac{l^2 B^2}{mR} V(t)$$

(b) Euler's method, $h = 10^{-6}$, 向下為正

(c) t 越大，越接近終端速度

Prob4:

(a)

$$\begin{aligned} V_S &= V_L + V_R + V_C = L \frac{dI}{dt} + IR + \frac{1}{C} \int_{t_0}^t I dt \\ V_L &= L \frac{dI}{dt} \\ V_R &= IR \\ V_C &= \frac{1}{C} \int_{t_0}^t I dt \end{aligned}$$

↓

$$\frac{d}{dt} V_S = L \frac{d^2 I}{dt^2} + R \frac{dI}{dt} + \frac{1}{C} I$$

(b) Euler's method, $h = 10^{-6}$

(c) Euler's method, $h = 10^{-6}$

(d) Euler's method, $h = 10^{-6}$

大約花 2.2 秒跑完