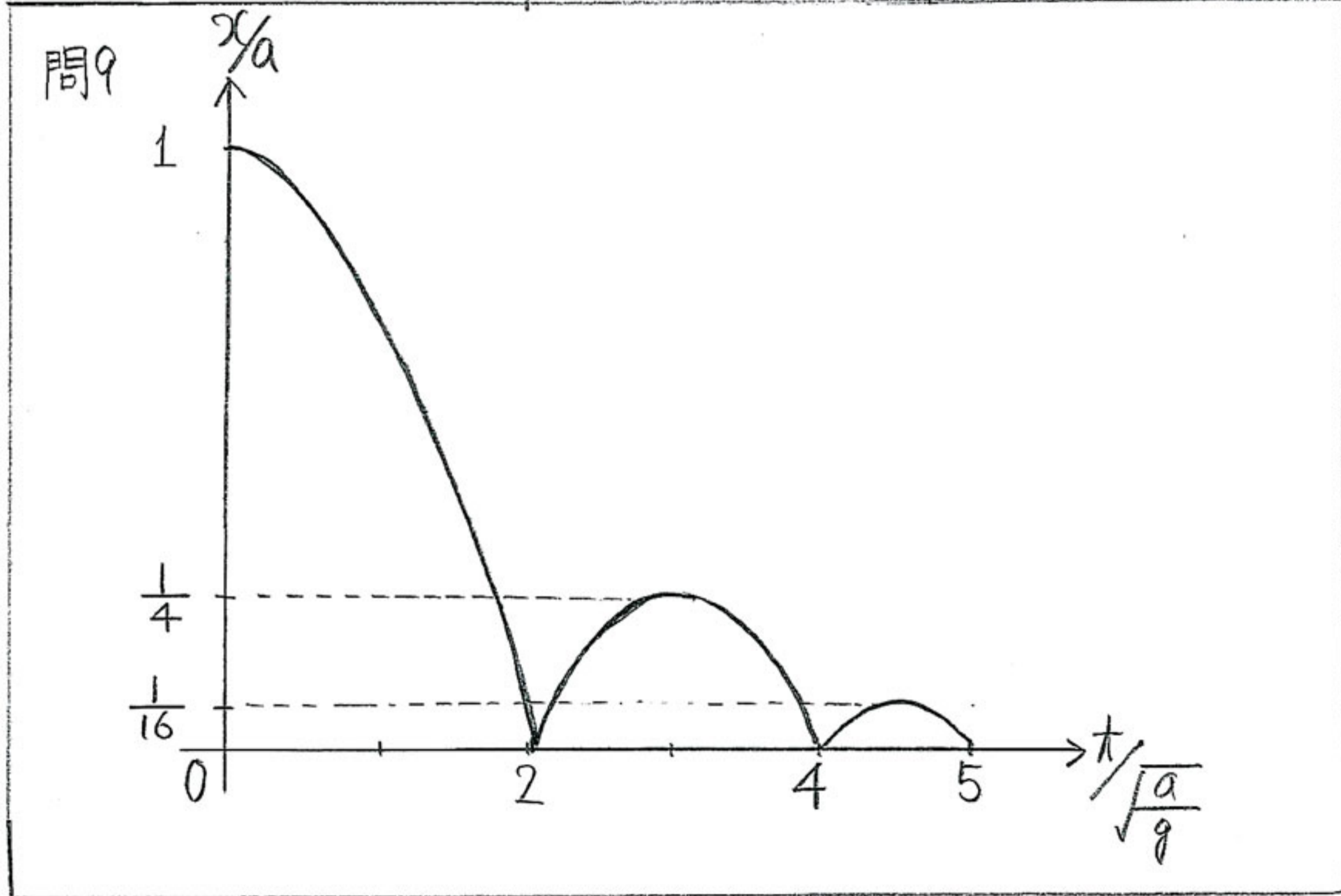


1

問1	$2\sqrt{\frac{a}{g}}$	問2	$-\sqrt{ga}$	問3	$e\sqrt{ga}$
問4	$-\frac{(1-e^2)mga}{2}$	問5	e^2a		
問6	$4e\sqrt{\frac{a}{g}}$	問7	$4e^n\sqrt{\frac{a}{g}}$	問8	$e^{2n}a$



2

問1 $2\pi\sqrt{\frac{a}{g}}$

問2 $ma\omega^2\sin\theta\cos\theta - mg\sin\theta$

問3 $2\pi\sqrt{\frac{a}{g-a\omega^2}}$

問4 $\sqrt{\frac{g}{a}}$

問5 $\omega_0 = \sqrt{\frac{2g}{a}}$, $N_0 = 2mg$

3

問1 $v_0 = 2a\sqrt{gl}$, $v_1 = 2b\sqrt{gl}$, $v_2 = 2c\sqrt{gl}$

問2 $\frac{a-b}{c}$

問3 $\frac{c-b}{a}$

問4 $\frac{m_2}{m_1} = 3$, $e = 0.2$

問5 $\frac{(a-b)(a+b-c)}{a^2}$

問6 $\frac{b}{a} = \frac{1-e}{2}$, $\frac{c}{a} = \frac{1+e}{2}$

問7 $\frac{1-e^2}{2}$

問8 $e=0$ のとき $\frac{\Delta E}{E} = \frac{1}{2}$

問1

$$(1) H = \frac{N}{l} I, \quad \Phi = \mu_0 \frac{N}{l} A I$$

$$(2) \mu_0 \frac{N^2 A}{l} \left| \frac{\Delta I}{\Delta t} \right| \quad (3) \mu_0 \frac{N^2 A}{l}$$

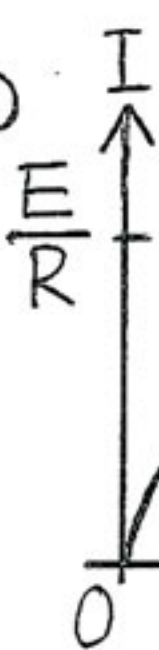
問2

(1) 自己誘導により、電流の変化が妨げられ、スイッチを閉じる前の OA が維持されるため。

$$\frac{\Delta I}{\Delta t} = \frac{E}{L}$$

$$(2) \frac{E}{R}$$

(3)

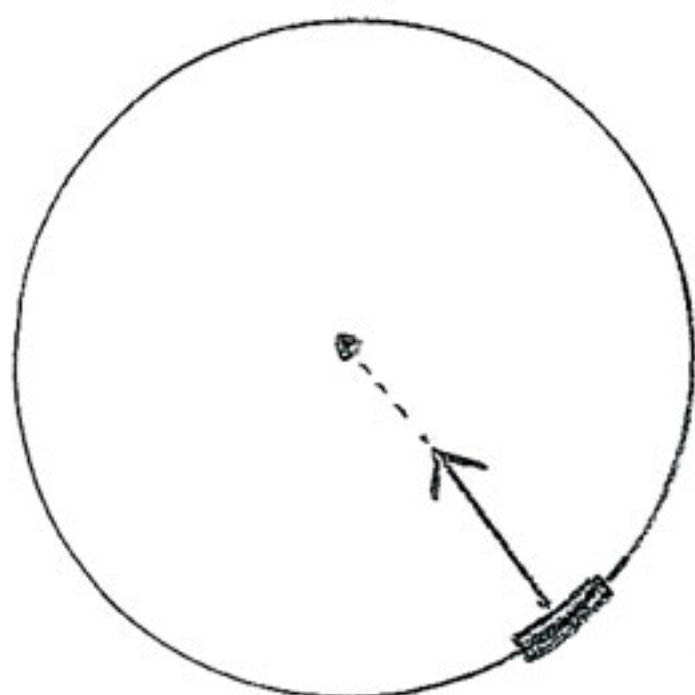


問3

$$(1) \frac{8\rho a}{d^2}$$

$$(2) \frac{\mu_0 \pi a^2 N E}{r l L}$$

(3)



$$F = 0$$

5

問1	$\frac{E}{3}$	問2	$\frac{E}{3R}$	問3	$\frac{2}{3}E$
問4	CE	問5	$\frac{2}{3}CE$	問6	$\frac{2}{9}CE^2$

6

問1	$\frac{V+u}{f_0}$	問2	$f_0 \frac{V}{V+u}$	問3	$f_0 \frac{V}{V-u}$
問4	$\frac{2Vu}{V^2-u^2} f_0$	問5	$f_0 \frac{V}{V-u}$	問6	$\frac{V-u}{V} T$

問1	(1) $f_0 \Delta T$ (2) $(V - v_0) \Delta T$ (3) $f_0 \frac{V}{V - v_0}$
問2	(1) $f_0 \Delta T$ (2) $(V - v_0 - ats) \Delta T$ (3) $f_0 \frac{V}{V - v_0 - ats}$ (4) $\frac{-v_0 + \sqrt{v_0^2 + 2Da}}{a}$ (5) $f_0 \frac{V}{V - v_0} \leq f \leq f_0 \frac{V}{V - \sqrt{v_0^2 + 2Da}}$
問3	(1) $\frac{D - v_0 ts - \frac{1}{2} ats^2}{V}$ (2) $\frac{V - v_0 - \sqrt{(V - v_0)^2 - 2a(Vt - D)}}{a}$ (3) $f_0 \frac{V}{\sqrt{(V - v_0)^2 - 2a(Vt - D)}}$

問1	$P_S = \frac{RT_S}{V_0}, \quad P_A = \frac{RT_A}{V_0}, \quad V_B = \frac{T_B}{T_S} V_0$
問2	$T_A, T_B, T_S \text{ の順}$
問3	$Q_{S \rightarrow A} = \frac{3}{2} R (T_A - T_S)$ $\Delta U_{S \rightarrow A} = \frac{3}{2} R (T_A - T_S)$ $W_{S \rightarrow A} = 0$
問4	$Q_{A \rightarrow B} = 0$ $\Delta U_{A \rightarrow B} = -\frac{3}{2} R (T_A - T_B)$ $W_{A \rightarrow B} = \frac{3}{2} R (T_A - T_B)$
問5	$Q_{B \rightarrow S} = -\frac{5}{2} R (T_B - T_S)$ $\Delta U_{B \rightarrow S} = -\frac{3}{2} R (T_B - T_S)$ $W_{B \rightarrow S} = -R (T_B - T_S)$
問6	$\frac{3T_A - 5T_B + 2T_S}{3(T_A - T_S)}$