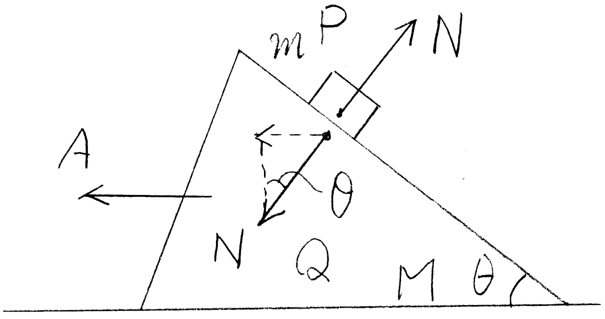
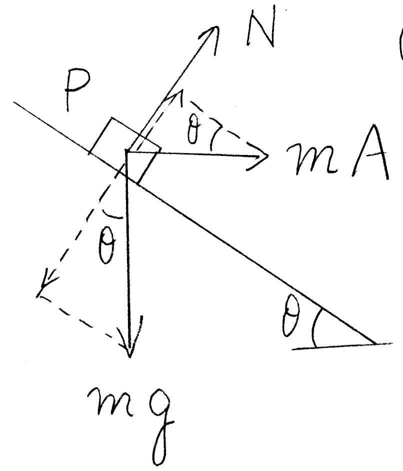


(1) $MA = N\sin\theta$ ……①

I



(2) QからみてPは斜面に沿って運動するから，

$N + mA\sin\theta - mg\cos\theta = 0$ ……②

(3) 題意を読み取りにくいが，NとAが未知数なので，仮においたAを消去する。

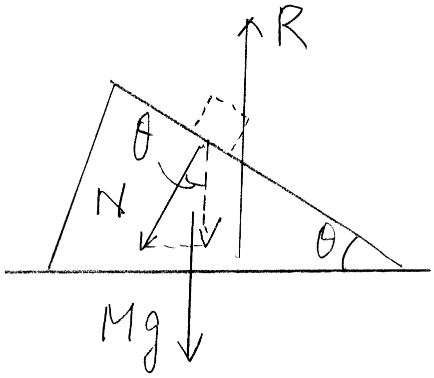
①を $A = \dfrac{N\sin\theta}{M}$ を②へ代入する。

$$N + \frac{mN\sin^2\theta}{M} - mg\cos\theta = 0$$

$$N\left(1 + \frac{m\sin^2\theta}{M}\right) = mg\cos\theta$$

$$N = \frac{Mmg\cos\theta}{M + m\sin^2\theta} \quad \cdots\cdots ③$$

(4)



$$R - N\cos\theta - Mg = 0$$

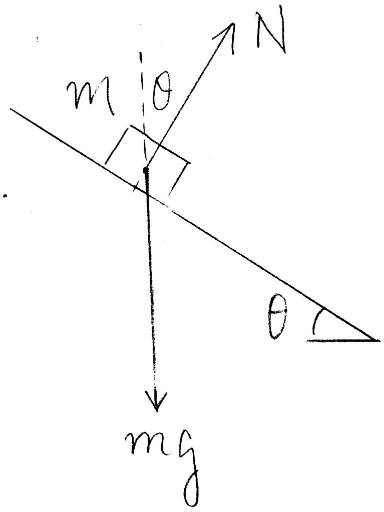
$$R = \frac{Mmg\cos^2\theta}{M + m\sin^2\theta} + Mg$$

$$= \frac{m\cos^2\theta + M + m\sin^2\theta}{M + m\sin^2\theta} Mg$$

$$= \frac{(m+M)M}{M + m\sin^2\theta} g$$

(22-2)

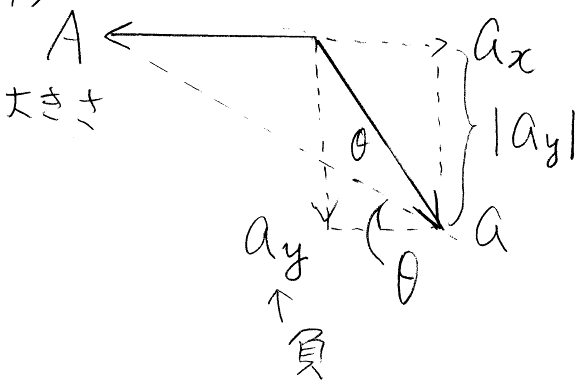
II



(5) $m a_x = N \sin\theta$

(6) $m a_y = N\cos\theta - mg$

(7)



$$\tan\theta = \frac{-a_y}{a_x + A}$$

Q $\quad -a_y = g - \frac{N}{m}\cos\theta = g - \frac{Mg\cos^2\theta}{M + m\sin^2\theta}$

$$= g\,\frac{M + m\sin^2\theta - M\cos^2\theta}{M + m\sin^2\theta}$$

$$= \frac{(M+m)\sin^2\theta}{M + m\sin^2\theta}\,g$$

$h = \frac{1}{2}(-a_y)t^2$

(22-3)

$$t = \sqrt{\frac{2h}{-a_y}} = \sqrt{\frac{2h \cdot (M + m\sin^2\theta)}{(M+m)\sin^2\theta \cdot g}}$$