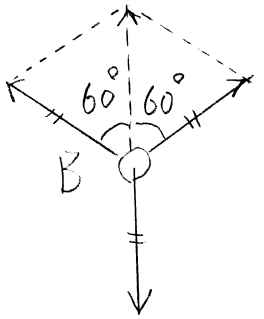
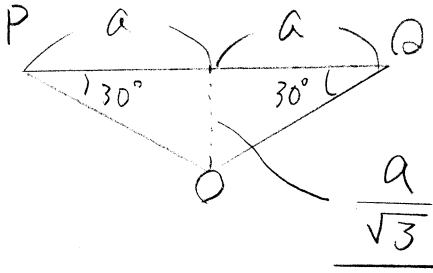
12

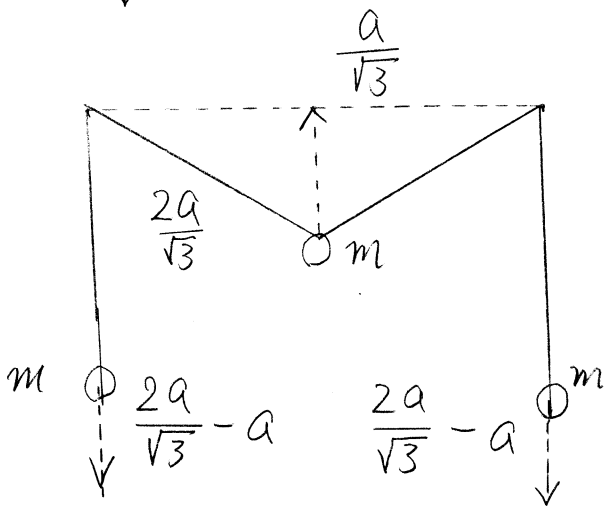
(1)




$\frac{a}{\sqrt{3}}$

(2)

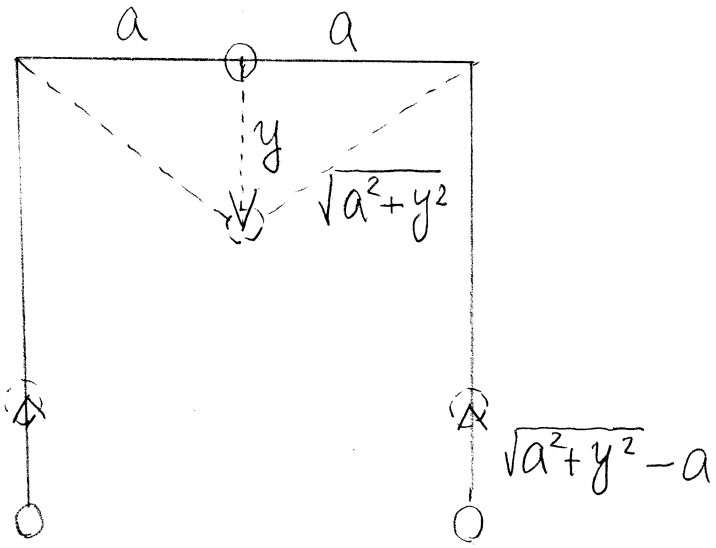



$$mg\cdot\frac{a}{\sqrt{3}}-2\cdot mg\left(\frac{2}{\sqrt{3}}-1\right)a$$

$$=\left(-\frac{3}{\sqrt{3}}+2\right)mga$$

$$=(2-\sqrt{3})mga$$

(3)



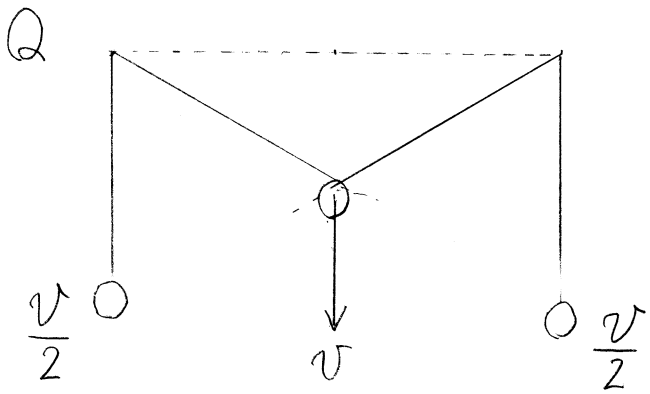

$$0=-mgy+2mg\left(\sqrt{a^2+y^2}-a\right)$$

$$y+2a=2\sqrt{a^2+y^2}$$

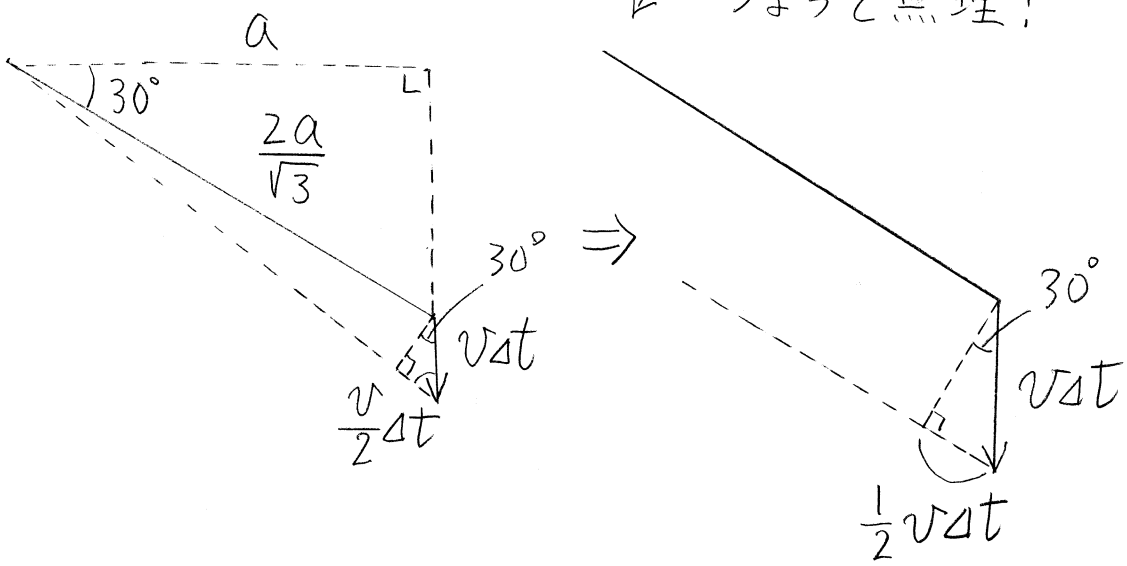
$$y^2+4ay+4a^2=4a^2+4y^2$$

$$3y^2-4ay=0 \qquad y=0,\ \frac{4}{3}a$$

(12-2)




考え方を
知っていないと
ちょっと無理！




(2)を利用して,

$$\frac{1}{2}mv^2+2\times\frac{1}{2}m\left(\frac{v}{2}\right)^2=(2-\sqrt{3})mga$$

$$\frac{3}{4}mv^2=(2-\sqrt{3})mga$$

$$v=2\sqrt{\frac{2-\sqrt{3}}{3}ga}$$