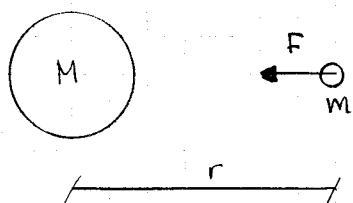


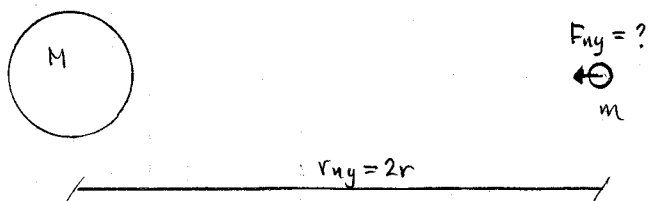
Ref 5-1



Ursprungliga gravitationskraften

$$F = G \frac{Mm}{r^2} \quad (*)$$

(a) Avståndet ~~är~~ dubblas så att $r_{ny} = 2r$

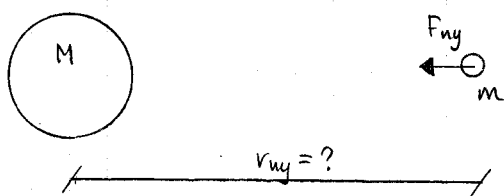


Nya gravitationskraften

$$F_{ny} = G \frac{Mm}{r_{ny}^2} = G \frac{Mm}{(2r)^2} = G \frac{Mm}{4r^2} = \frac{1}{4} G \frac{Mm}{r^2} = \frac{1}{4} F$$

Svar: $\frac{1}{4} F$

(b) Bestäm avståndet r_{ny} så att $F_{ny} = \frac{F}{2}$.



Lös först ut r ur (*):

$$r = \sqrt{\frac{GMm}{F}}$$

Nu får vi

$$r_{ny} = \sqrt{\frac{GMm}{F_{ny}}} = \sqrt{\frac{GMm}{\frac{F}{2}}} = \sqrt{\frac{2GMm}{F}} = \sqrt{2} \sqrt{\frac{GMm}{F}} = \sqrt{2} r$$

Svar: $\sqrt{2} r$