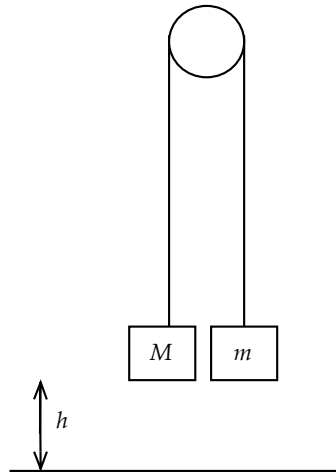


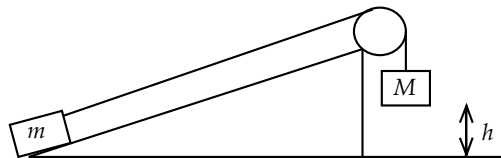
M1 Pulleys

1. Two particles of mass m kg and M kg (with $M > m$) are held at the same height h above the ground. The system is then released from rest.



- (a) Find an expression for the maximum height above the ground reached by m .
- (b) Find an expression for the time taken for m to reach its maximum height. $\sqrt{\frac{2h}{g} \left(\sqrt{\frac{M+m}{M-m}} + \sqrt{\frac{M-m}{M+m}} \right)}$

2. A system is setup as below. m is at the bottom of a slope inclined at θ° to the horizontal.



- (a) Find an expression for the maximum distance that m makes it up the slope before stopping if the slope is smooth.
- (b) Find an expression for the maximum distance that m makes it up the slope before stopping if the slope is rough with coefficient of friction μ .