Physics Notes 7

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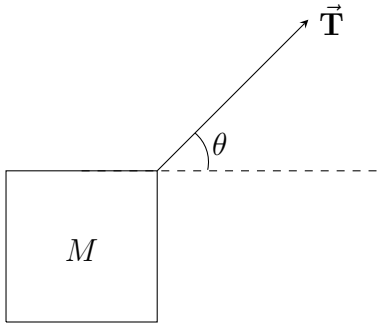
1 Introduction

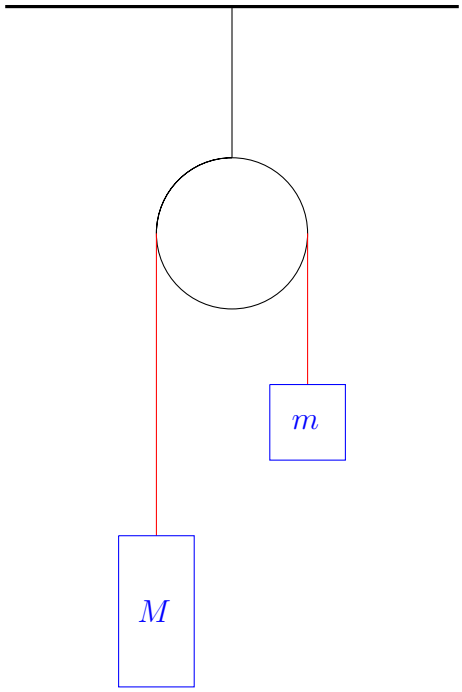
$\vec{\mathbf{T}}$ is the force vector of the rope tugging on the box M.



With what acceleration should the box be moving so that it comes off the ground?

2 Notes

- Tension: is constant through the rope.
- It points to the inside of the rope.



$$T - Mg = MA \tag{1}$$
$$T - mg = ma \tag{2}$$
$$A = -a \tag{3}$$
$$T - mg = M(-a) \Rightarrow T = Mg - Ma \tag{4}$$
$$\tag{5}$$

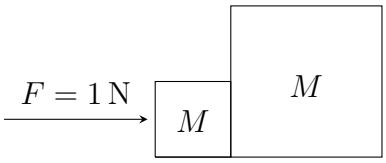
3 Newton's Third Law

"For every force, there is an equal and opposite reaction."

If object A exerts force $\vec{\mathbf{F}}$ on object B, then object B also exerts force $-\vec{\mathbf{F}}$ on object A.

3.1 Example Problem

With what velocity will the boxes move?



$$F + f = mA \tag{6}$$