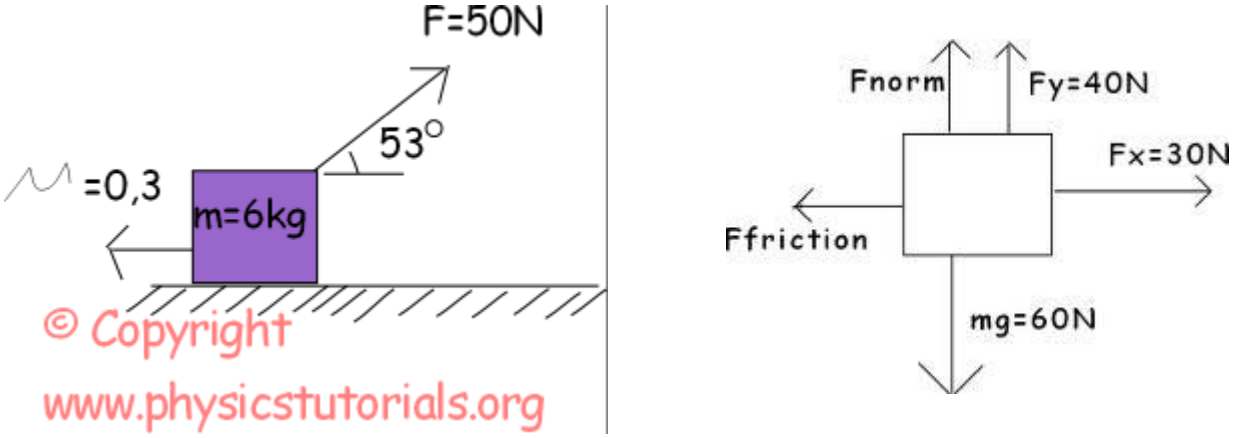
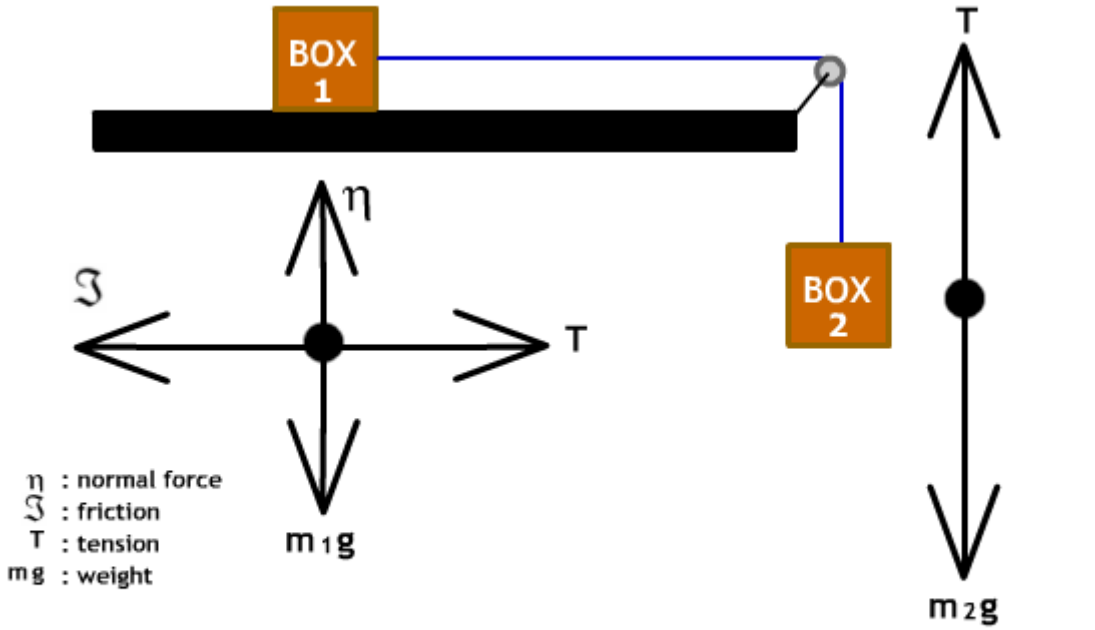
Example 1: Crate with applied force and friction acting.



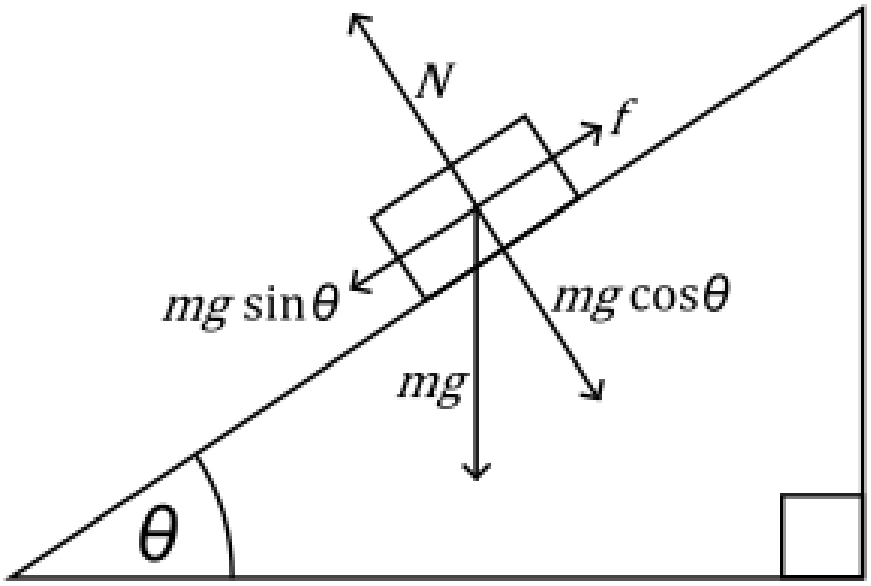
Example 2: System of two objects connected by cable with friction acting. No resolution of forces is required in this case.



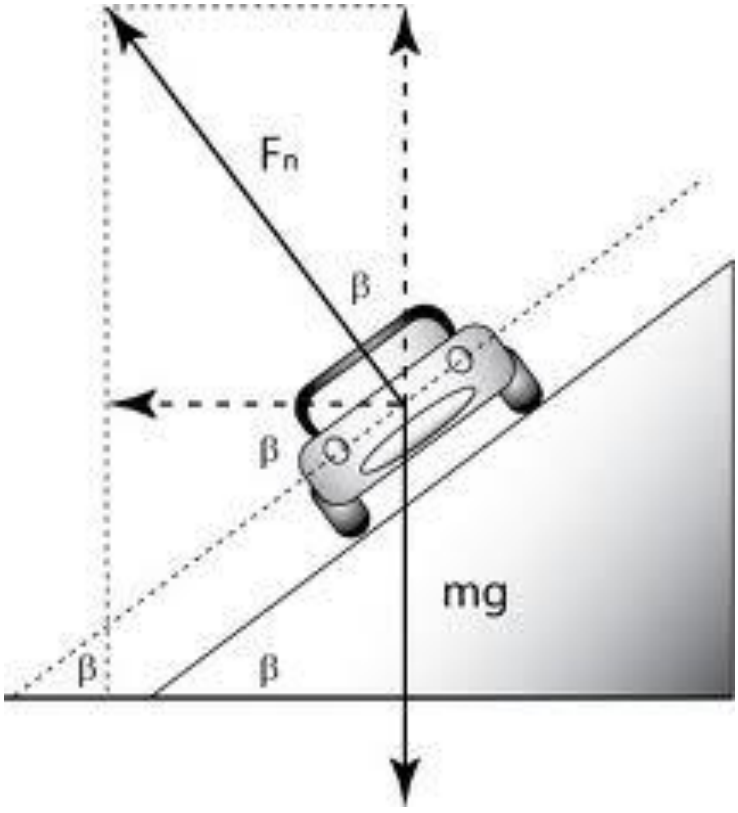
The mg's are different because the boxes may have diferent masses. That is why they have subscripts on them. There are two tensions in the two free body diagrams. The single pulley only redirects the force. Because they T's are on opposite ends of the same rope, they are the same tension and NOT two different tensions.

by T.Wayne

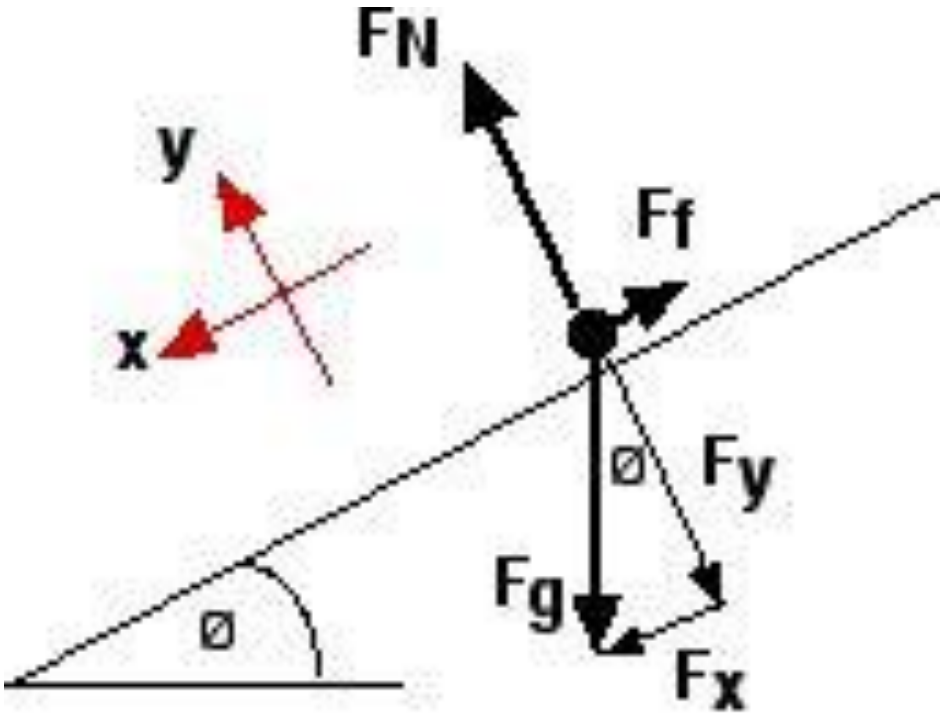
Example 3: Object at rest on incline. Gravity has been resolved into parallel ***x*** and perpendicular **y** components. *f* balances *mg* sinθ.



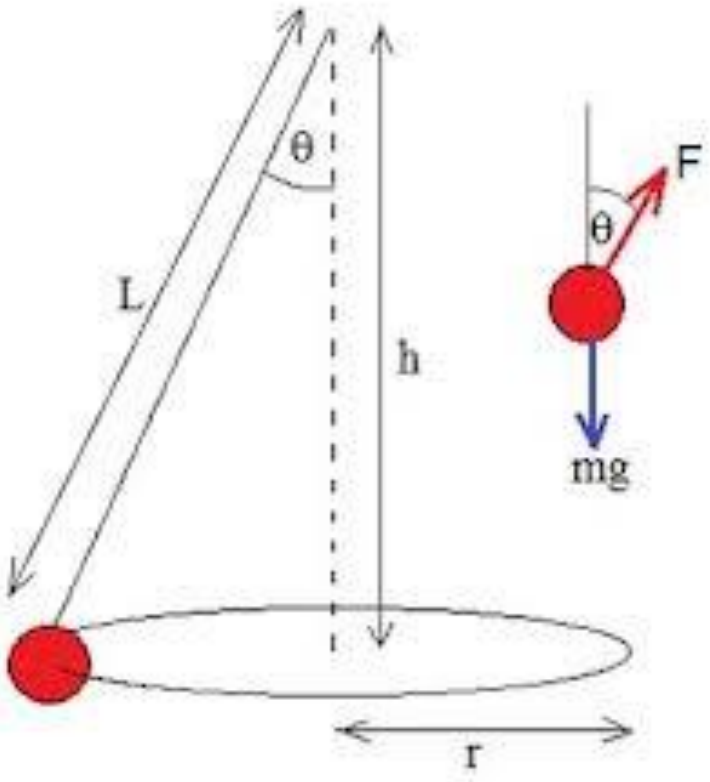
Example 4: Car travelling around a banked curve with no friction. Normal force has been resolved into horizontal and vertical components.



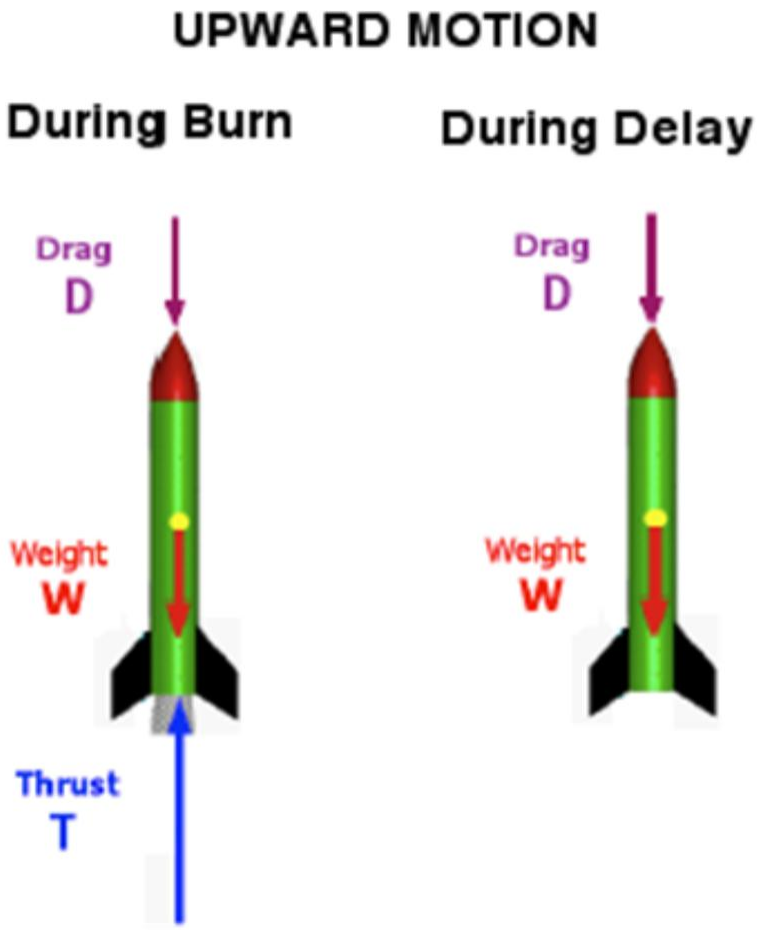
Example 5: Object sliding down an incline with friction acting. Gravity has been resolved into parallel ***x*** and perpendicular ***y*** components.



Example 6: Object attached by a cord rotating in a horizontal circular path about a central vertical axis. F should be resolved into horizontal ***x*** and vertical ***y*** components.



Example 7: Rocket during thrust and free-fall phases of its motion with air resistance.



Example 8: Object hanging at rest from two ropes. T_1 and T_2 should both be resolved into horizontal ***x*** and vertical ***y*** components.

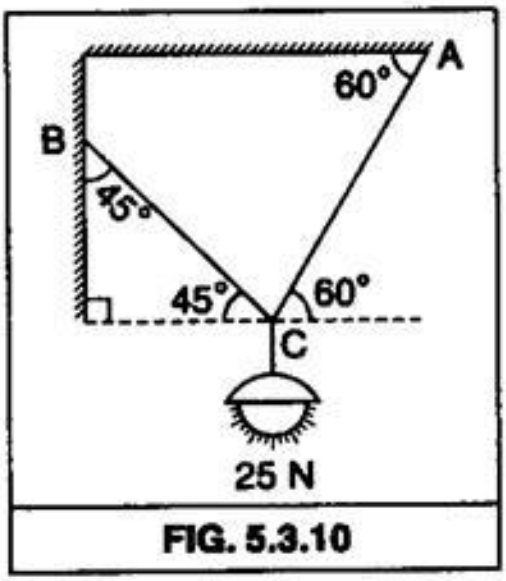


FIG. 5.3.10

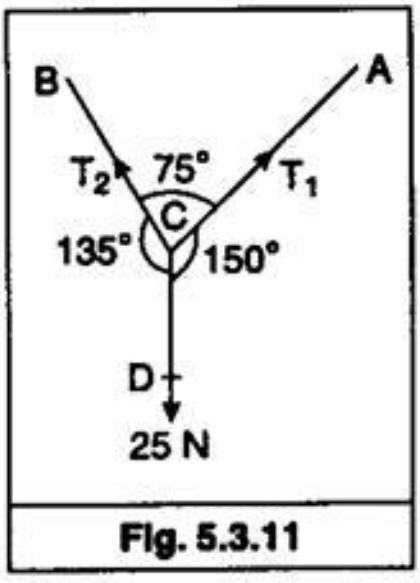
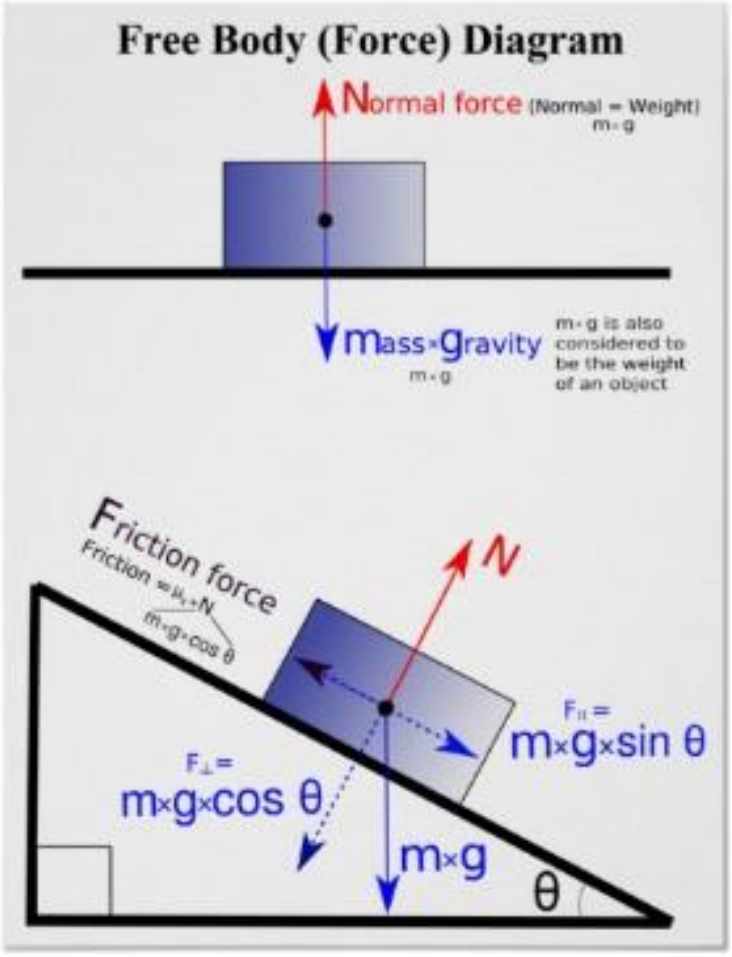


Fig. 5.3.11


Free Body (Force) Diagram
Normal force (Normal = Weight)
m·g
mass·gravity
m·g
m·g is also considered to be the weight of an object
Friction force
Friction = μk·N
(m·g·cos θ)
N
F∥ =
m×g×sin θ
F⊥ =
m×g×cos θ
m×g
θ