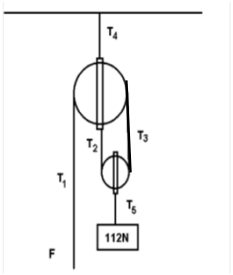
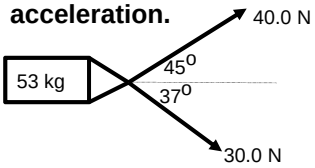
Example

A 112N weight is attached to a two-pulley system. A downward force F must be applied to keep the mass in equilibrium. Assuming the pulleys are of very small mass, calculate F, T_1, T_2, T_3, and T_4.



Examples

- Calculate the sum of the forces acting on the boat in water. Also calculate its acceleration.



Ignore the resistive force due to the water.

Ans: 53.3 N 11.0° above horizontal; 1.0 m/s² 11.0°

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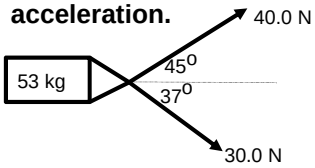

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Example

- Two railroad cars, each of mass 6500kg traveling at 95km/hr, collide head-on and come to rest. How much energy is lost? where does it go? Hint:You must consider both cars.

- *Answer*: 4.5×10^6J

Example

- A gun with a muzzle velocity of 4.0×10^2 m/s horizontally fires a 12 g bullet into a 2.0kg block resting on a frictionless surface. The bullet comes to rest after traveling 15 cm.
  - What are the impulse and change in momentum of each object just after the collision?
  - What is the work done on the bullet by the block in bringing it to a complete stop?
  - What is the force and average power required to stop the bullet?
  - What is the average acceleration of the bullet?
  - What is the work done on the block in this time.
- *Answer*: 4.8kgm/s; -960 J; 6400 N; P = 1.3×10^6W; a = 5.3×10^5 m/s²;5.7J