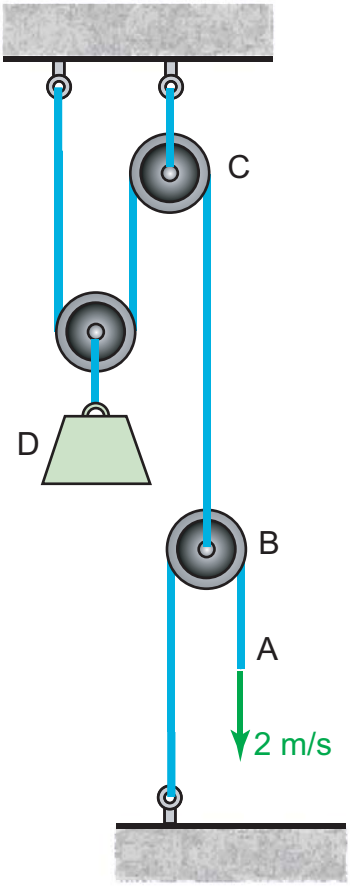
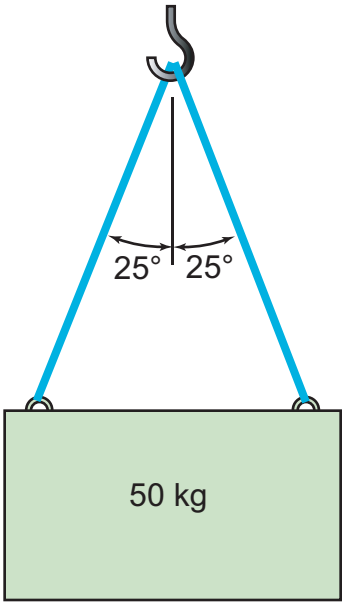
Example

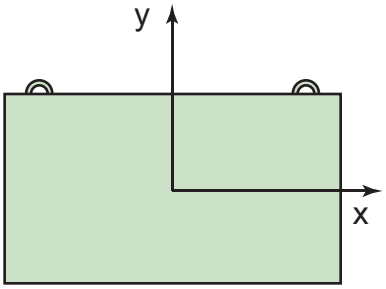
The cable at A is pulled downwards at 2 m/s and is slowing at 1 m/s^2. Determine the velocity and acceleration of block D at this instant.



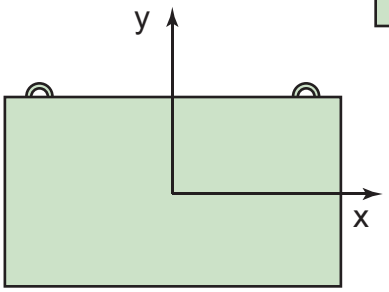
Example

A 50 kg load is initially at rest, then a hoisting mechanism raises the load 1 m over 2 s at constant acceleration. Determine the load in the two cables.





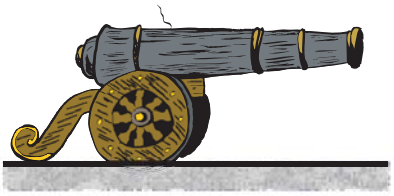
FBD



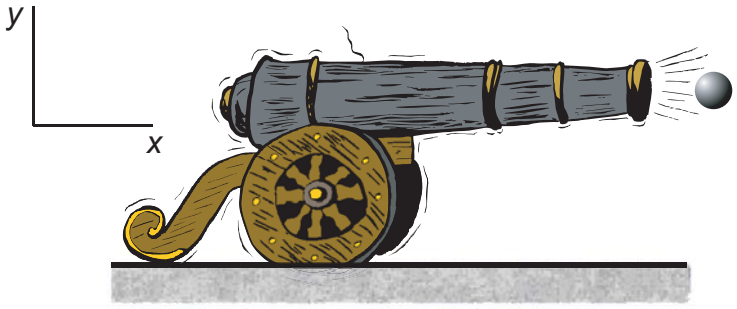
Kinetic Diagram

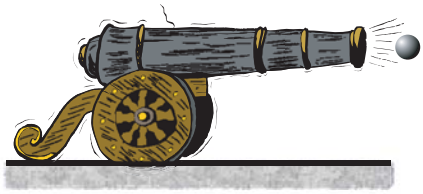
Example

The cannon has a muzzle velocity of 100 m/s for a 4kg ball. The combined weight of the system shown is 250 kg. If the system is initially at rest, what is the speed of the cannon as the ball exits the cannon?



Initial Kinetic Diagram





Final Kinetic Diagram

Example

Marbles A, B, and C, each having a mass of 5 grams, are on a smooth horizontal surface. A is given a velocity of 1 m/s as shown. A hits B, causing B to hit C. Velocities after impact are in the directions shown. Assuming no friction and all perfectly elastic collisions, determine the magnitudes of the velocities for each marble.