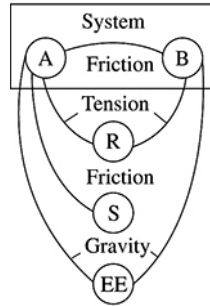


7.5. Visualize: Please refer to Figure EX7.5.

Solve: (a) Gravity acts on both blocks, and where Block A is in contact with the floor there is a normal force and friction. The string tension is the same on both blocks since the rope and pulley are massless, and the pulley is frictionless. There are two third law pairs of forces at the surface where the two blocks meet. Block B pushes against Block A with a normal force, while Block A has a reaction force that pushes back against Block B. There is also friction between the two blocks at the surface.

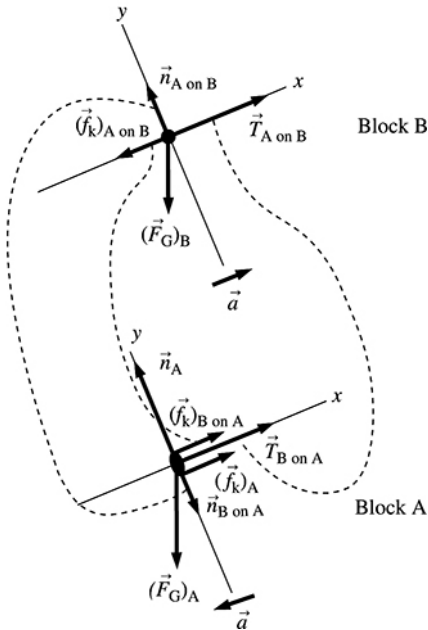
Interaction diagram



(b) A string that will not stretch constrains the two blocks to accelerate at the same rate but in opposite directions. Block A accelerates down the incline with the same acceleration that Block B has up the incline. The system consists of the two blocks, as indicated in the figure.

(c)

Free-body diagrams



Assess: The inclined coordinate systems allow the acceleration a to be purely along the x -axis. This is convenient since the one component of a is zero, simplifying the mathematical expression of Newton's second law.