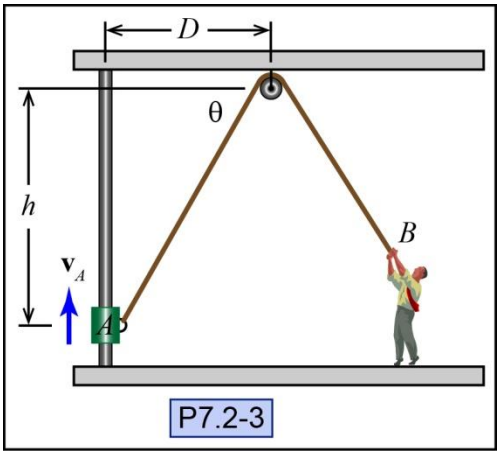
P7.2-3) The man shown applies a constant 100-N force to the end of the cord at B and lifts the 5-kg collar A up the smooth vertical shaft a distance of 2 m. If the distances shown in the figure at the beginning of the collar's motion are h = 8 m and D = 5 m, determine the total work done on the collar.



Given:

Find:

Solution:

Free-body diagram

Draw a fbd of collar A.

Work

Which of the forces do no work on the collar?

Which forces or force components do work on the collar?

Derive the total work done on the collar as a function of F (the force applied by the man), h, D, m, g and y (the distance the collar move upward.)

U = _____

Plugging in numbers, calculate the work in Joules.

U = 64.3 J