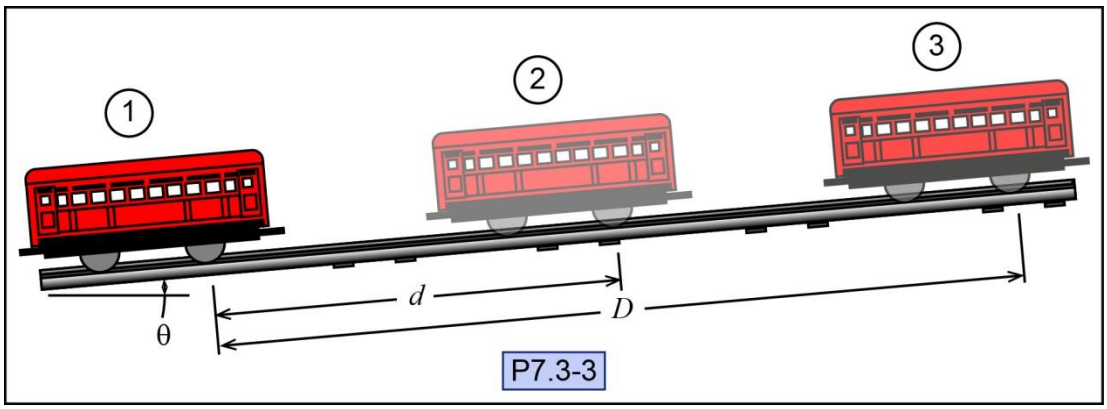
P7.3-3)[fe] A 15,000-kg train car rolls up a 5%-grade track. Initially, the train car is traveling at 40 kph. After the car has coasted for a distance of d = 50 m, the brakes are applied. The braking force is constant and equal to 2% of the train car's weight. Neglecting rolling resistance, determine the total distance D that the train car travels before coming to a complete stop.



P7.3-3

Given:

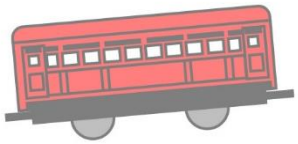
Find:

Solution:

Is this a conservative or non-conservative system overall?

Conservative Non-conservative

Free-body diagram



Work-Energy Balance

Write down the work-energy balance equation in variable form between states 1 and 3.

W-E.Eq: _____

Solve for D.

a) D = 104.3 m b) D = 110.5 m
c) D = 125.7 m d) D = 132.9 m