Exercise

Vector in Real Life II Part II

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W-E principle

Given a spring has a force constant of spring, k = 360 N/m.

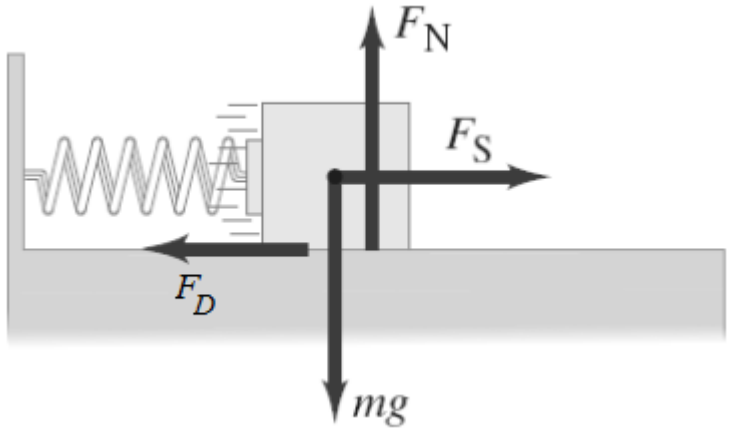
(a) Calculate work needed to compress the spring to x = 11.0 cm. Given uncompressed length is x = 0

(b) A 1.85 kg block is put against the spring and the spring is released. Find the speed of the block when it splits from the spring at x = 0? Assume no friction.

2.18 J, 1.54 m/s

W-E principle

c) Again a 1.85 kg block is put against the spring and released, but the block is now moving on a table. Given the friction force is F_D = 7.0 N. This F_D will retard the movement of the block. Calculate the speed.



1.23 m/s

Power

A 500 kg drag car racer accelerates from rest to a speed of 110 m/s. The drag race is held at Kuantan race track with 400 m length. The average frictional force of 1200 N occur between the tyres and the surface of the road. Calculate its power in watts and horsepower if the race takes 7.30 s?

480 kW or 644 hp

Power

- Alia pulls her 15 kg shopping cart along a Jusco sidewalk by applying a 10 N force at to the horizontal. Assume that friction is negligible and that the wagon starts from rest.
  - How much work does Alia do on the shopping cart in the first 2.0 s.
  - How much instantaneous power does Alia exert at t = 2.0 s?

a. 8.51 J; b. 8.51 W