

Problem solving involving work, energy and power

Starter

1. **(Review of last lesson)**

In a pop-gun a cork of mass 4 grams is shot out of the barrel by the release of a spring, which is compressed through a distance of 5 cm. A force of $6x$ N is needed to keep the spring compressed by x cm. Find the speed at which the cork leaves the barrel.

Hint: be careful with units.

2. One end of a light elastic string, of natural length 1.5 m and modulus of elasticity 30 N, is attached to a fixed point A of an inclined plane. The other end of the string is attached to a particle P of weight 25 N which lies on the plane. The plane makes an angle α with the horizontal, where $\tan \alpha = \frac{3}{4}$, and the string is parallel to a line of greatest slope of the plane. The coefficient of friction between P and the plane is 0.15.
- (a) P is in equilibrium and the extension of the string is x m. Find the greatest and least value of x .
- (b) P is released from rest in the position where $AP = 2$ m. By considering energy and work, find the distance AP when P first comes to rest.

Notes

No new notes.

AMSP Notes (password needed): [Variable force \(work, energy and impulse\)](#)

AMSP (password needed): [Integral Exercise Level 1](#)

AMSP (password needed): [Integral Solutions Level 1](#)

AMSP (password needed): [Integral Exercise Level 2](#)

AMSP (password needed): [Integral Solutions Level 2](#)

[Solutions to Starter and E.g.s](#)

Exercise

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