

## Module 08-Lesson 6

### Energy Diagrams

**Question 1:** A particle slides back and forth on a frictionless track. The particle's height as a function of horizontal position  $x$  is described by  $y(x) = (0.8 \text{ m}^{-1})x^2$ . If the particle has a maximum speed of 9.0 m/s, find its turning point(s).

**Question 2:** A graph of the potential energy stored in an elastic band as a function of the square of the distance  $x$  when it has stretched from its equilibrium position is shown in Fig. 1. (a) Does the band obey Hooke's law? Explain your reasoning. (b) What is the force constant of the band?

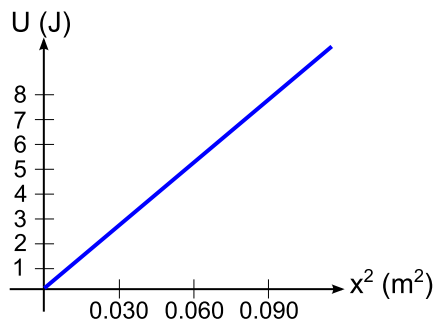


FIG. 1: Potential energy stored in an elastic band

**Problem:** Fig. 2 presents the potential energy diagram for a 80-g ball in a pinball machine, that is starting with speed 2 m/s at point A. (a) What is the total mechanical energy of the ball? (b) Calculate the speeds of the ball at points B, C, and D.

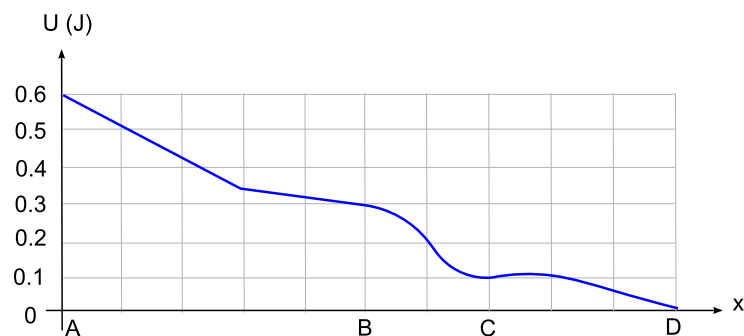


FIG. 2: Potential Energy of a Pinball