

Worksheet: Damped Oscillations



Q1: The amplitude of a lightly damped oscillator decreases by 3.0% during each cycle. What percentage of the mechanical energy of the oscillator is lost in each cycle?



Question Video

A 12%

B 14%

C 4.0%

D 6.0%

E 9.0%

Q2: If a car has a suspension system with a force constant of 5.00×10^4 N/m, how much energy must the car's shocks remove to dampen an oscillation starting with a maximum displacement of 0.0750 m?



Question Video

A 150 J

B 141 J

C 155 J

D 162 J

E 170 J

Q3: A car with a mass of 1 530 kg bounces vertically with an initial velocity of 0.940 m/s, returning to its original vertical position after bouncing. How much energy must the car's shock absorbers dissipate in order to dampen the bounce? Assume that the drag is negligible.

A 338 J

B 951 J

C 1 350 J

D 676 J

E 719 J

Q4: What quantity is the damping force in damped and forced vibrations proportional to?

A momentum of the vibrating object

B weight of the vibrating object

C velocity of the vibrating object

D mass of the vibrating object

E displacement of the vibrating object