Suggested problems
Chapter 15

The quiz questions will be same or very similar to the following text-book problems.
Refer to the course website for the latest version of this document.
You are encouraged to seek the help of your instructor during his office hours.

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8. What is the phase constant for the harmonic oscillator with the position function x(t) given in Fig. 15-28 if the position function has the form $x = x_m \cos(\omega t + \Phi)$? The vertical axis scale is set by x_s = 6.0 cm.

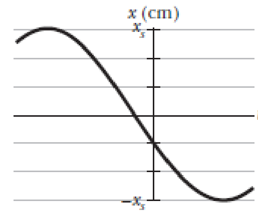

Fig. 15-28 Problem 8.

Answer: - 4.37 rad

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11. In Fig. 15-29, two identical springs of spring constant 7580 N/m are attached to a block of mass 0.245 kg. What is the frequency of oscillation on the frictionless floor?

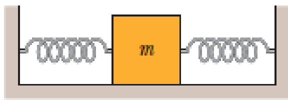

Fig. 15-29
Problems 11 and 21.

Answer: 39.6 Hz

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30. An oscillating block–spring system has a mechanical energy of 1.00 J, an amplitude of 10.0 cm, and a maximum speed of 1.20 m/s. Find (a) the spring constant, (b) the mass of the block, and (c) the frequency of oscillation.

Answer: (a) 200 N/m (b) 1.39 kg (c) 1.91 Hz

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41. In Fig. 15-40, the pendulum consists of a uniform disk with radius r = 10.0 cm and mass 500 g attached to a uniform rod with length L = 500 mm and mass 270 g. (a) Calculate the rotational inertia of the pendulum about the pivot point. (b) What is the distance between the pivot point and the center of mass of the pendulum? (c) Calculate the period of oscillation.

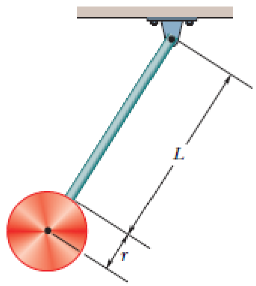

Fig. 15-40 Problem 41.

Answer: (a) 0.205 kg · m^2 (b) 47.7 cm (c) 1.50 s