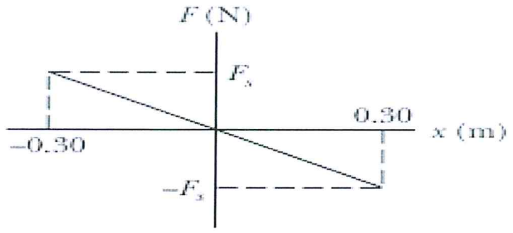
A simple harmonic oscillator consists of a 0.50 kg block attached to a spring. The block slides back and forth along a straight line on a frictionless surface with equilibrium point x = 0. At t = 0 the block is at x = 0 and moving in the positive x direction. A graph of the magnitude of the net force on the block as a function of its position is shown in Fig. The vertical scale is set by Fs = 75.0 N. What are
(a) the amplitude and
(b) the period of the motion,
(c) the magnitude of the maximum acceleration, and
(d) the maximum kinetic energy?



Problem: 5

The scale of a spring balance that reads from 0 to 15.0 kg is 12.0 cm long. A package suspended from the balance is found to oscillate vertically with a frequency of 2.00 Hz. (a) What is the spring constant?
(b) How much does the package weigh?

Problem: 6

A transverse Wave on string is described by the following wave function:

$$y = (0.120\ m)\sin\left[\left(\frac{\pi x}{8}\right) + 4\pi t\right]$$

(a) Determine the transverse speed and acceleration at t= 0.200 s for the point on the string located at x = 1.60 m.

(b) What are the wavelength, period and speed of propagation of this wave?

Problem: 7

What phase difference between two identical traveling waves, moving in the same direction along a stretched string, results in the combined wave having an amplitude 1.50 times that of the common amplitude of the two combining waves? Express your answer in (a) degrees, (b) radians, and (c) wavelengths.

Problem: 8

Consider two waves that are superposing