Physics
Wave Equation P.S.

Name_____
Date _____Hour

1) Find the λ of a sound wave (331 m/s velocity) of frequency values as follows:
   a. 20 Hz

   b. 100 Hz

   c. 440 Hz

   d. 1000 Hz

   e. 20000 Hz

2) Find the f for the light waves with the following λ's. ($v_{light} = 3 * 10^8$ m/s)
   a. 40 nm

   b. 6000 A (1 Angstrom = 10^{-10} meters)

   c. 0.76 μm

3) Find the audible frequency of a 3.28-foot long sound wave at 341 m/s.

4) Write the wave equation to solve for velocity in terms of λ and period, rather than in terms of λ and f. Instead of $v=f\lambda$, $v=$ . . .

5) If the length of a sound wave is 0.892 meters, and its frequency is a constant 400 Hz, calculate the velocity of that sound wave. (356.8 m/s)

6) A physics student continuously shakes a spring so that the resulting standing wave produced is measured as 170 cm in length. If the shaking is at a frequency of 0.277 Hertz, . . .

a. What is the speed of the wave's travel on the spring?

b. What wavelength would result if the spring were shaken through 63 cycles in 19 seconds?

7) A sound wave at 358 m/s has a frequency of 36,000 cycles every 3 seconds. Calculate the λ and draw two cycles of it to the correct scale below using a ruler. Use crest and trough amplitudes of 1 cm each.

8) The wave below takes 3 seconds to pass a point. Give the answers requested. Feel free to use a ruler when needed.

a. Amplitude

b. T

c. Number of cycles shown

d. λ

e. v

f. Vertical displacement at α

$v = \lambda / T$