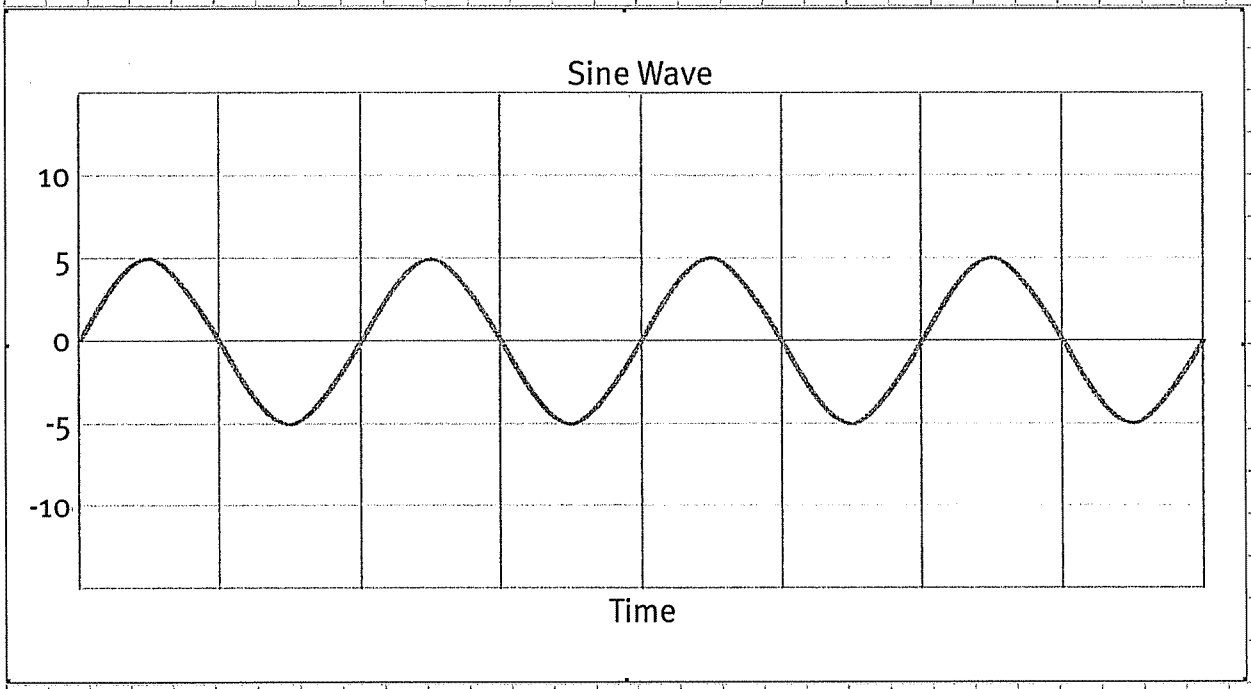
Physics 11 U7 Waves - Worksheet #1

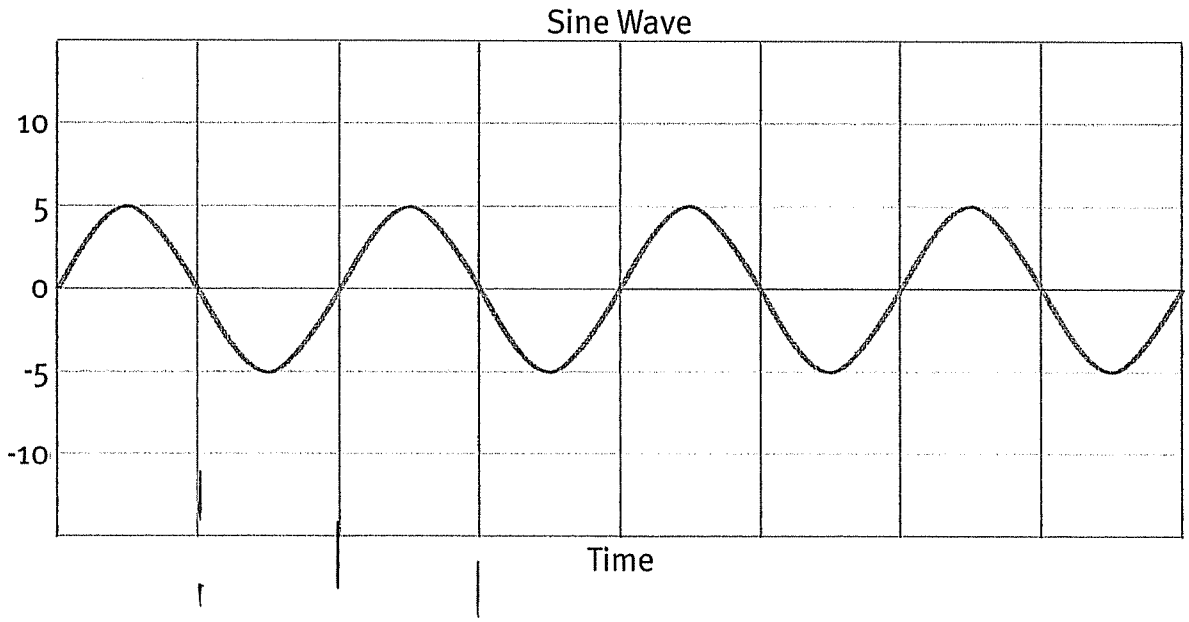
Amplitude, wavelength, phase, frequency, period, universal wave equation

Name: _____

Key



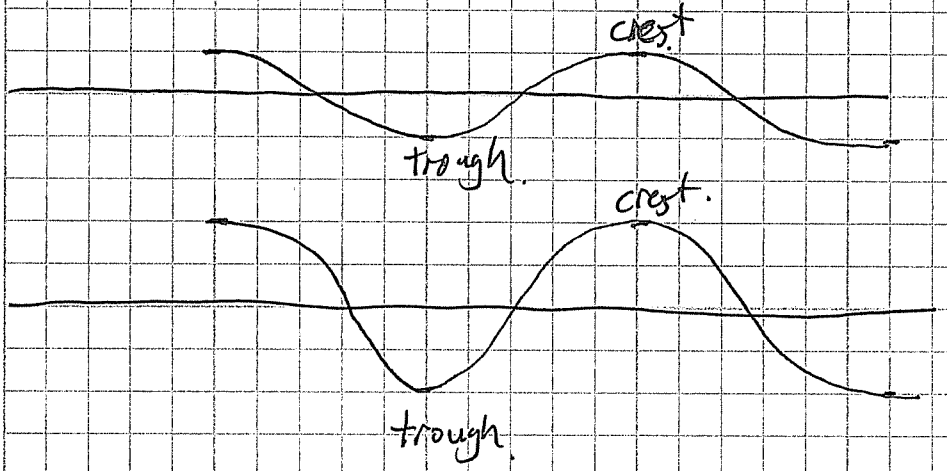
1. Using the above diagram as a starting place draw a wave with a similar shape but double the amplitude. Label the amplitude and wave length.



2. Use the diagram at the top of page as a starting place draw a wave with twice the wave length and half the amplitude. Label the amplitude and wave length.

approx.

3. Draw two waves that are in phase. The second wave with twice the amplitude of the first. Label the crests and troughs.



4. A slinky vibrates back and forth 30 times in 12 seconds. Calculate the period and the frequency of the slinky.

$T = \frac{\text{time}}{\#\text{event}} = \frac{12}{30} = 0.4\,\text{sec}$ $\quad f = \frac{1}{T} = 2.5\,\text{Hz}$

5. A sound wave has a frequency of 1500 Hz. Calculate the period. Calculate how many vibrations would occur in 12 seconds.

$T = \frac{1}{f} = \frac{1}{1500} = 0.00067\,\text{sec}$

1500 Hz means 1500 in one sec → × 12 sec
= 18,000 event.

6. Sound waves travel at approximately 330 m/s (depends on temperature). Calculate the wave length of a 55 Hz sound wave.

$v = f\lambda \Rightarrow \quad 330 = (55)(\lambda)$

$\lambda = 6\,\text{m}$

7. Calculate how long it would take someone to hear a thunder clap 3 km distant.

$d = v \cdot t$

$3000 = 330\ t$

$t = 9.09\ sec$

3000m.

8. Calculate the frequency of a sound wave in air that has a wavelength of 30 cm (0.3 m).

$v = \lambda f$

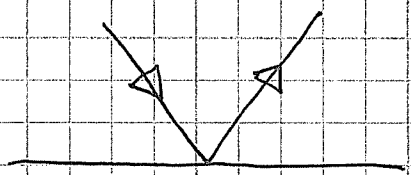
$330 = (0.3) f$

$f = 1100\ Hz$

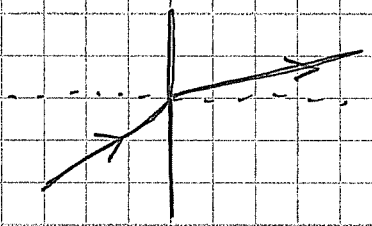
0.3m.

9. For each term below draw a picture or symbol beside the term that represents that phenomenon.

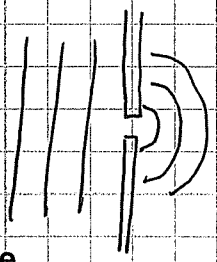
a) reflection



b) refraction



c) diffraction



d) interference