NAME: _____, Sect. #_____

Physics 109   Homework # 1
due Monday, September 18, 2001

- <u>Prefixes</u> for large numbers are **k** for kilo (**1000**), **M** for mega (**10^6**) and **G** for giga (**10^9**).
- <u>Prefixes</u> for small numbers are **m** for milli (**10^{-3}**), μ for micro (**10^{-6}**), and **n** for nano (**10^{-9}**).
- <u>Weight of a mass</u> depends on how strong gravity is at that location. On earth, the acceleration of gravity is g = 9.8 m/s^2. The weight is figured as <u>w = mg</u>.
- spring constant <u>k</u> is related to force <u>F</u> and elongation (stretching) <u>x</u> by <u>F = kx.</u>

1. A dog can hear frequencies up to 40,000 Hz
   a) express this frequency in kHz.

   b) find the period of this oscillation. Express the answer in s, in ms and in μ s.

2. If Jim has a mass of 70 kg, how much many Newtons does he weigh on earth where the acceleration of gravity is g= 9.8 m/s^2?

   if Jim is on the moon where the acceleration of gravity is only 0.15 m/s^2, how much will he weigh?

3. for the oscillation on the right, the horizontal axis (time) is in <u>msec</u>.

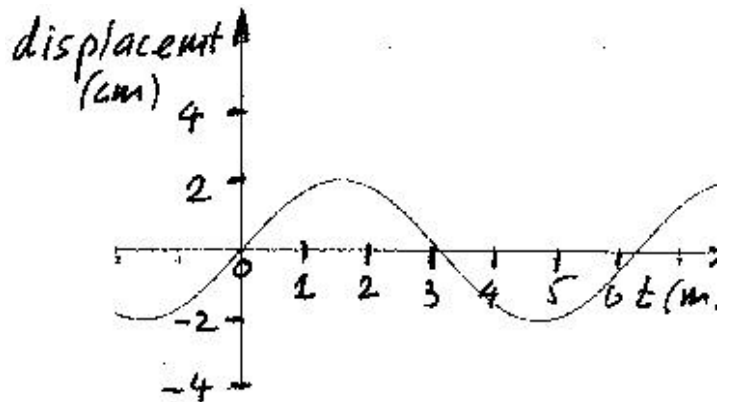   find the period T in <u>sec</u> and in <u>msec</u>:

   T =

   find the frequency <u>in Hz</u> and <u>in kHz</u>:

   f =

   find the amplitude

   A =

4. The length of a spring is measured for different pulls F:

pull F: 2N   4N   6N   8N   10N
 length of spring: 20cm   25cm   30cm   35cm   40 cm

Find the spring constant in N/cm and in N/m

5. For simple harmonic motion (mass on a spring) the frequency is the same, no matter whether the amplitude is large or small.