$\qquad$ Hour $\qquad$

pts., due $\qquad$


Show all of your work!

1. The speed of light is $\qquad$
2. Radio wavestravel at what speed? $\qquad$
3. What other unit is a Hzequal to ? $\qquad$ --
4. 

a. Find the speed of a wave if it has a frequency of 280 Hz and a wavelength of 2 meters. (ans. $560 \mathrm{~m} / \mathrm{s}$ )
b. How long will it take the wave in part a to travel one mile? (ans. 2.87 sec.$)$
c. What is the period of the wave? (ans. 0.0036 sec.$)$
5. A typical light wave hasa wavelength of 580 nm . ( $1 \mathrm{~nm}=10^{-9} \mathrm{~m}$ ) Calculate the frequency of that wave. (ans. $5.17 \times 10^{14} \mathrm{~Hz}$ )
6. A sound wave produced by a clock chime is heard 515 meters away 1.5 seconds later. The period of the sound wave is 0.00229 second. What is the wavelength of the sound wave? (ans. 0.79 m )
7. If a sound wave has a frequency of 133 Hz and a wavelength of 2.5 meters, how long would it take for you to hear the sound if you were 50 meters away from the source of it? (ans. 0.15 sec .)
$\qquad$ Hour $\qquad$
8. The speed of sound in sea water is $1,530 \mathrm{~m} / \mathrm{s}$. A sonar signal is sent straight down from a ship at a point just below the water's surface, and 1.80 seconds later the reflected signal is detected. How deep is the ocean beneath the ship? (ans. 1,377 m) (Hint- the signal has to travel down and back up. Keep that in mind when you are asked forjust the depth.)
9.
a. Calculate the period of a wave from 101.3 FM- KDWB. (ans. $9.87 \times 10^{-9} \mathrm{~s}$ )
b. Calculate the wavelength of the signal from KDWB. (ans. 2.96 m )
c. Calculate the wavelength of the signal from 1440 AM. (ans. 208.3 m)
10. If blue light has a wavelength of 450 nanometers, what is its frequency? ( $1 \mathrm{~nm}=1 \times 10^{-9} \mathrm{~m}$ ) $\left(6.67 \times 10^{14} \mathrm{~Hz}\right.$ )
11. Explain why baseball bats have a "sweet spot." Include a sketch.
12. Show how we got the wave speed equation. (It's in your Wave notes.)
13. When you watch a fireworks display do you see or hear the fireworks first and why?

