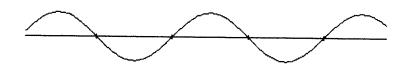
	Name:		Date:	
S	PH3U <u>Univ</u>	ersal Wave	Equation Prob	<u>olems</u>
Pe	otentially useful equations			
	$f = \frac{1}{2}$		$T = \frac{1}{f}$	$v = f\lambda$
1.	Convert the following fr a) 340 Hz b) 20			
2.	A tuning fork's tines vib a) the frequency of vibr b) the period of vibration	ation	s in 2.0 s. Find	
3.	The frequency of a tuning fork is 1000 Hz. If the wavelength is 35 cm, find the spee of the sound wave in			
	a) m/s b) km.	Th .		
5.	b) the period of the wav c) the velocity of the wav Find the period and veloc found to be 0.50 m:	ve	lowing frequen	ncies if the wavelength was
	a) 0.30 Hz	b) 400 s ⁻¹	c) 10	02.1 MHz
6.	periods:		that wavelength	n is 75 cm for the following
	a) 0.020 s b) 15 s	ns c) 0.	6 h	
7.	A source with a frequency of 20 Hz produces water waves that have a wavelength of 3.0 cm. What is the speed of the waves?			
3.	A wave in a rope travels at a speed of 2.5 m/s. If the wavelength is 1.3 m, what is the period of the wave?			
).	An FM station broadcasts radio signals with a frequency of 92.6 MHz. If these radio waves travel at a speed of $3x10^8$ m/s, what is their wavelength?			
0.	You are shouting in a mor 300 m away. If the speed	otone voice v	vith a frequency	y of 440 Hz. Your friend is

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11. This full scale diagram shows a series of wave crests. Successive crests pass a given point in 0.5 s.



- a) What is the amplitude of this wave? (measure this)
- b) What is the wavelength in centimetres? (measure this)
- c) What is the frequency?
- d) What is the velocity of the waves?
- 12. A given crest of a water wave requires 5.2 s to travel between two points on a fishing pier located 19 m apart. It is noted in a series of waves that 20 crests pass the first point in 17s. What is the wavelength of the wave? (A diagram would help)
- 13. Two men are fishing from small boats located 30 m apart. Waves pass through the water, and each man's boat bobs up and down 15 times in 1.0 min. At a time when one boat is on a crest the other one is in a trough, and there is one crest between the two boats. Draw a well labelled diagram. What is the speed of the waves?

Numerical Answers:

- 1. a) $2.9 \times 10^{-3} s$
- 2. a) 125 Hz
- 3. a) 350 m/s
- 4. a) 3.4 m
- 5. a) 3.3s; 0.15 m/s
- 6. a) 50 Hz; 37.5 m/s
- 7. 0.6 m/s
- 8. 0.52 s
- 9. 3.24 m
- 10.385
- 11. a) 0.7 cm
- 12. 3.1 m
- 13. $5 \, m/s$

- b) 0.05s
- b) $8.0 \times 10^{-3} s$
- b) 1260 km/h

b) 4.3 cm

- b) $8 \times 10^{-3} s$
- b) $2.5 \times 10^{-3} s$; 200 m/s

c) 2 Hz

c) $9.8 \times 10^{-9} s$; $5.1 \times 10^7 \text{ m/s}$

c) 3s

c) $425 \, m/s$

- b) 67 Hz; 50 m/s
- c) $4.6 \times 10^{-4} \text{ Hz}$; $3.5 \times 10^{-4} \text{ m/s}$
 - d) 8.6×10^{-2} m/s