

Practice Quiz 2

These are Q's from old quizzes. I do not guarantee that the Q's on this year's quiz will be the same, or even similar.

What are the amplitude, frequency, wavelength, and speed of a water wave whose displacement is described by $y(x,t) = 0.25 \cos (0.52x - 2.3t)$, where x,y are in meters, and t is in seconds.

B

- a. 0.25m, 1Hz, 6m, 6.1m/s
- b. 0.25m, 0.4Hz, 12m, 4m/s
- c. 0.5m, 0.4Hz, 10m, 2m/s
- d. 0.4m, 0.3Hz, 12m, 4.4m/s

A boat is moored in a fixed location, and waves make it move up and down. If the spacing between wave crests is 20m and the speed of the wave is 5m/s. How long does it take the boat to go from the top of a crest to the bottom of a trough?

A

- A) 2s B) 4s C) 16s D) 8s E) 1s

The maximum frequency the human ear can detect is about 20kHz. If you walk into a room in which there are two sources, one at 100kHz and one at 102kHz. Will you hear anything? What if the second source is at 125kHz?

D

- A) Yes, yes.
- B) No, no.
- C) Yes, but only in certain places in the room for the first case, and no in the second case.
- D) Yes, no.
- E) No, yes.

At a soccer game, the "wave" might circulate through the stands and move around the stadium. In this wave motion, people stand up and sit down as the wave passes. What type of wave would this be characterized as?

- A) polarized wave
- B) longitudinal wave
- C) transverse wave
- D) gravitational wave
- E) soliton wave

What length is necessary for an organ pipe to produce a 22Hz tone if the pipe is open at one end and closed at the other?

- B A) 2m
- B) 4m
- C) 6m
- D) 8m
- E) 10m

Microwaves travel with the speed of light, $c=300\,000\,000\text{m/s}$. At a frequency of 10 GHz these wave cause water molecules in your burrito to vibrate. What is their wavelength?

1GHz = 1000 000 000 cycles/sec.

- B A) 0.3mm
- B) 3cm
- C) 30cm
- D) 300m
- E) 3km

A machine part is vibrating according to the equation

$$A(t) = 1.8\text{cm} \sin(31.4 t/\text{sec}) .$$

What is the frequency of the vibration? And at what time $t > 0$ does it reach it's trough for the first time?

A

- a) 5Hz and 0.15s
- b) 5Hz and 0.05s
- c) 10Hz and 0.15s
- d) 10Hz and 0.05s
- e) 30Hz and 0.1s

A body of unknown mass is attached to an ideal spring with force constant 120N/m. It is found to vibrate at a frequency of 6.00Hz.

What's the mass of the body?

C

- a) 1 gram
- b) 10 gram
- c) 100 gram
- d) 1000 gram
- e) 10 kg