

Use the diagrams of different sound waves to answer the following questions.



5. Which wave has the highest frequency? D

6. Which wave has the lowest pitch? E

7. Which wave has the lowest frequency? E

8. Which wave has the highest pitch? D

9. List the waves in order, from highest pitch to lowest pitch. D, B, A, C, E

10. Which wave has the greater amplitude? C

11. Which wave has the greater wavelength? E

12. Which wave is the loudest? C

13. If a water wave vibrates up and down 2 times each second and the distance between wave crests is 2.85 m.

a) What is the frequency of the wave?

2 waves/second

b) What is the wavelength of the wave?

2.85 meters

c) What is the speed of the wave?

$$v = \lambda \cdot f = 2 \frac{\text{w}}{\text{s}} \cdot 2.85 \text{ m} = 5.7 \text{ m/s}$$

d) What is the period of the wave?

$$f = \frac{1}{\text{period}} \quad \text{Period} = \frac{1}{2} \frac{\text{seconds}}{\text{wave}}$$

WAVES REVIEW

1. A tennis coach paces back and forth along the sideline 10 times in 2.0 minutes. What is the frequency of his pacing in Hz?

$$\frac{1}{5} \text{ Hz}$$

"how often"

$$\frac{10 \text{ times}}{2 \text{ minutes}} = \frac{1 \text{ once}}{5 \text{ mins}}$$

2. What is the speed of a wave that has frequency of 3.5 Hz and a wavelength of 0.70 m?

$$v = \lambda \cdot f = 3.5 \text{ Hz} \cdot 0.7 \text{ m} = \frac{f}{\lambda} = 2.45 \text{ m/s}$$

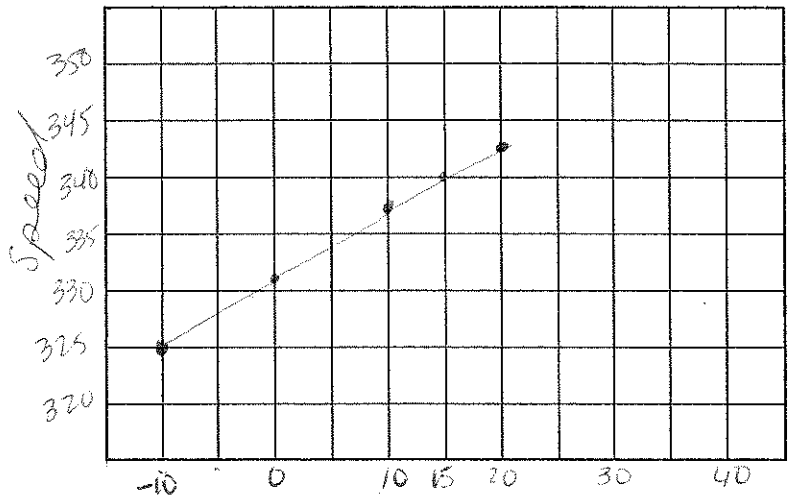
3. The speed of an S-wave in a string is 15.0 m/s. If a source produces a frequency of 6.00 Hz, what is its wavelength?

$$v = \lambda \cdot f$$

$$\lambda = \frac{v}{f} = \frac{15 \text{ m/s}}{6 \text{ Hz}} = 2.5 \text{ m}$$

The following data show the speed of sound in air at various temperatures. Plot the data on the graph provided. Then, answer the questions that follow.

SPEED OF SOUND IN AIR	
Temperature (°C)	Speed (m/s)
-10	325
0	331
10	337
20	343



1. From your graph, find the speed of sound at 15°C.
2. Use your graph to determine how much the speed of sound changes for every 1° change in temperature.

$$\text{slope} = \frac{\text{speed}}{\text{temp}} = \frac{343 - 325}{20 - 10} = \frac{18}{10} = 1.8 \text{ m/s for every } 1^\circ \text{ change}$$

3. Suppose that a person exploring Antarctica shouts to a person several hundred meters away. At the same time, a person in tropical Africa shouts to a person the same distance away. Will the person in Antarctica or the person in Africa hear the shout first? Why?

Africa, because sound travels faster in warm air

4. Do you think there is a temperature at which sound cannot be heard? Explain your answer.

absolute zero