1 A fisherman noticed that a float makes 30 oscillations in 15 seconds. The distance between two consecutive crests is 2 m. What is the period and frequency of the wave? What is the wave speed?

2 What is the wave speed if the period is 4.0 seconds and the wavelength is 1.8 m?

3 What is the frequency of a wave traveling with a speed of 1.6 m/s and the wavelength is 0.50 m?

4 What is the wavelength of a wave traveling with a speed of 3.0 m/s and the period of 6.0 s?

5 **A fisherman noticed that a wave strikes the boat side every 5 seconds. The distance between two consecutive crests is 1.5 m. What is the period and frequency of the wave? What is the wave speed?**

6 What is the wave speed if the period is 7.0 seconds and the wavelength is 2.1 m?

7 What is the period of a wave traveling with a speed of 20 m/s and the wavelength is 4.0 m?

8 What is the wavelength of a wave traveling with a speed of 6.0 m/s and the frequency of 3.0 Hz?

9 A string with a linear density of 8.0 g/m (0.008 kg/m) is under tension of 200 N. What is the speed of the wave?

10 A wave speed in a piano string of linear density 5.0 g/m (0.005 kg/m) is 140 m/s. What is the tension in the string?

11 A wire with a linear density of 15 g/m (0.015 kg/m) undergoes a tension force of 250 N. A transverse wave with a wavelength of 0.40 m is produced in the wire. What is the wave speed? What is the frequency of oscillations?

12 A string with a linear density of 4.0 g/m (0.004 kg/m) is under tension of 150 N. What is the speed of the wave?

13 A wave speed in a guitar string of linear density 9.0 g/m (0.009 kg/m) is 160 m/s. What is the tension in the string?

14 A guitar string with a linear density of 25 g/m (0.025 kg/m) undergoes a tension force of 400 N. A transverse wave with a wavelength of 0.80 m is produced in the wire. What is the wave speed? What is the frequency of oscillations?

15 A guitar string vibrates with a fundamental frequency of 330 Hz. What are the frequencies of first four harmonics?

16 A stretched wire resonates in three loops at a frequency of 180 Hz. What are the first four harmonics?

17 A stretched wire with a length of 2.0 m resonates in two loops. The wave speed is 120 m/s. What is the wavelength? What are the first three harmonics?

18 A violin string vibrates with a fundamental frequency of 450 Hz. What are the frequencies of first four harmonics?

19 A piano string resonates in five loops at a frequency of 250 Hz. What are the first four harmonics?

20 A violin string with a length of 0.50 m resonates in five loops. The wave speed is 200 m/s. What is the wavelength? What are the first three harmonics?

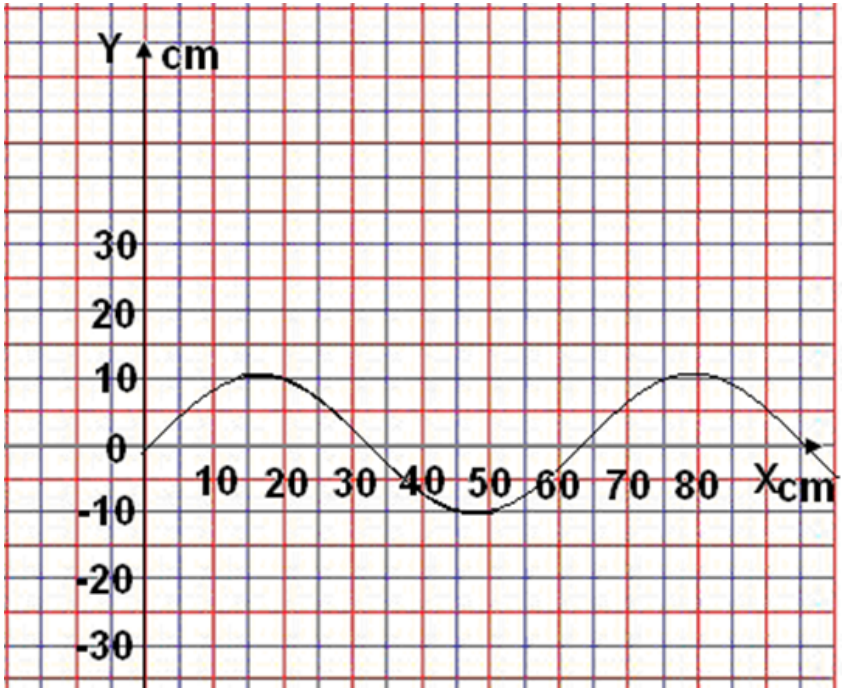
21 A "snapshot" of a wave is given to the right. The frequency of oscillations is 240 Hz.

a. What is the amplitude of the wave?

b. What is the wavelength of the wave?

c. What is the wave speed?

d. What is the wave period?



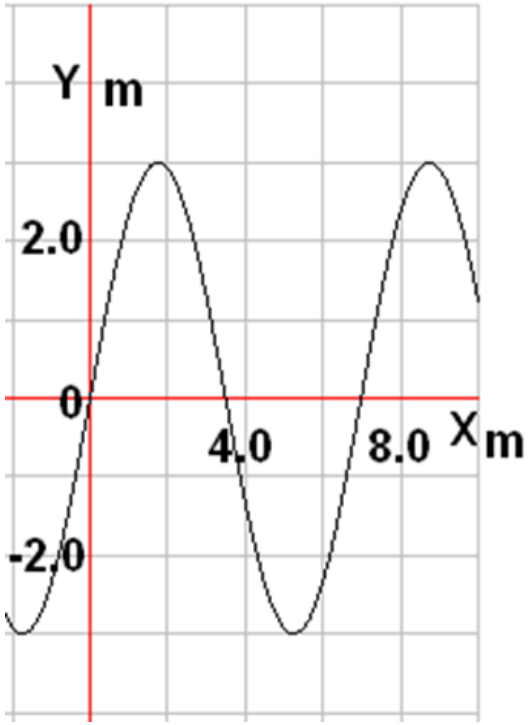
22 A "snapshot" of a wave is given below. The frequency of oscillations is 120 Hz.

a. What is the amplitude of the wave?

b. What is the wavelength of the wave?

c. What is the wave speed?

d. What is the wave period?



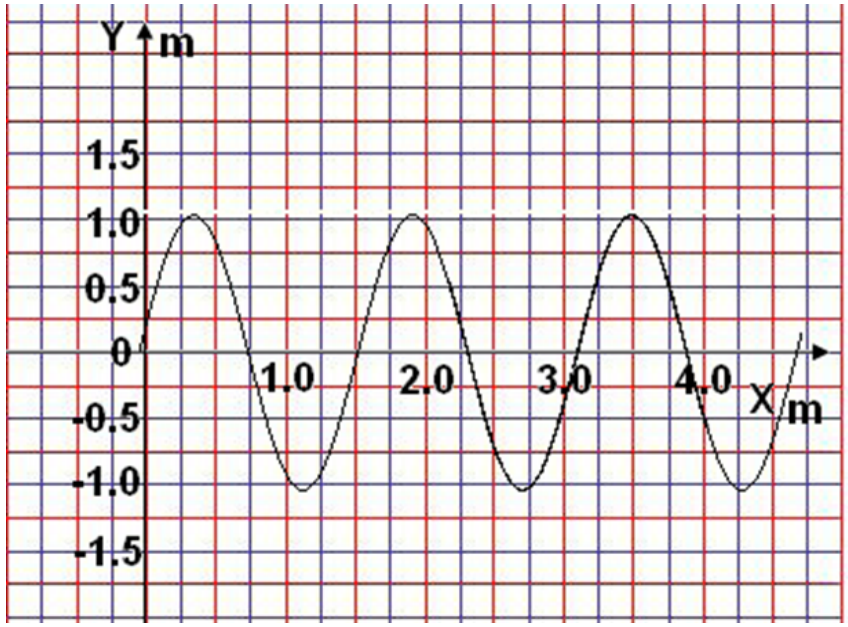
23 A "snapshot" of a wave is given below. The frequency of oscillations is 160 Hz.

a. What is the amplitude of the wave?

b. What is the wavelength of the wave?

c. What is the wave speed?

d. What is the wave period?



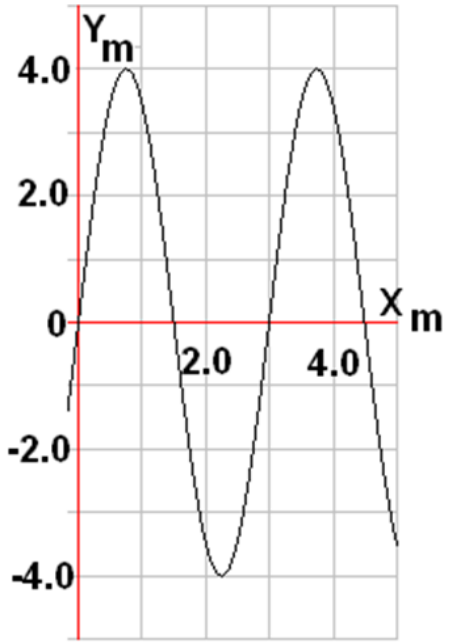
24 A "snapshot" of a wave is given to the right. The frequency of oscillations is 100 Hz.

a. What is the amplitude of the wave?

b. What is the wavelength of the wave?

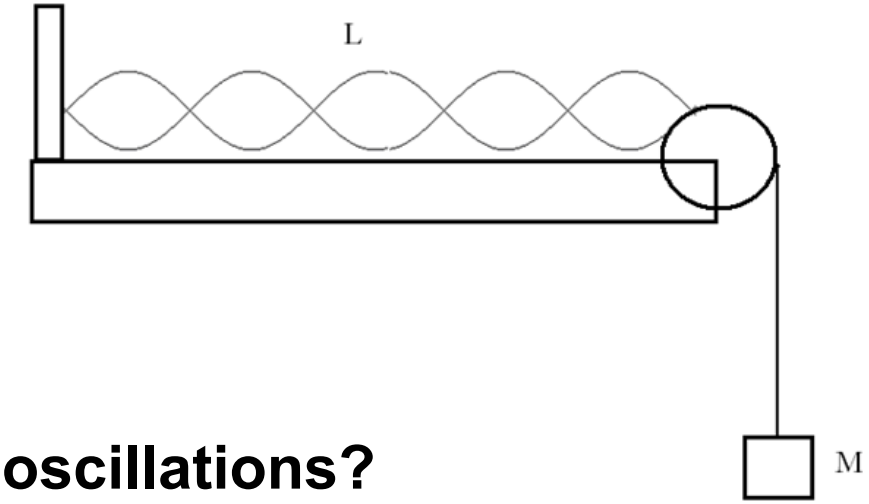
c. What is the wave speed?

d. What is the wave period?



General problems

1. A string with a length of 2.5 m resonates in five loops as shown above. The string linear density is 0.05 kg/m and the suspended mass is 0.5 kg.



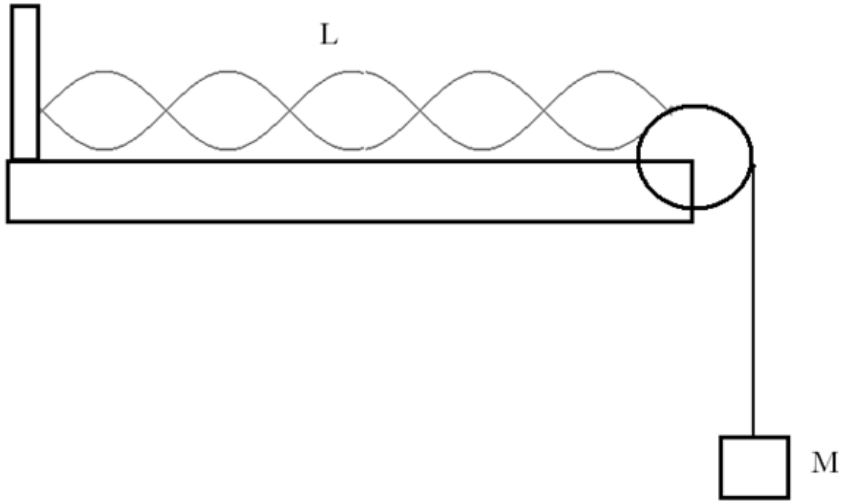
a. What is the wavelength?

b. What is the wave speed?

c. What is the frequency of oscillations?

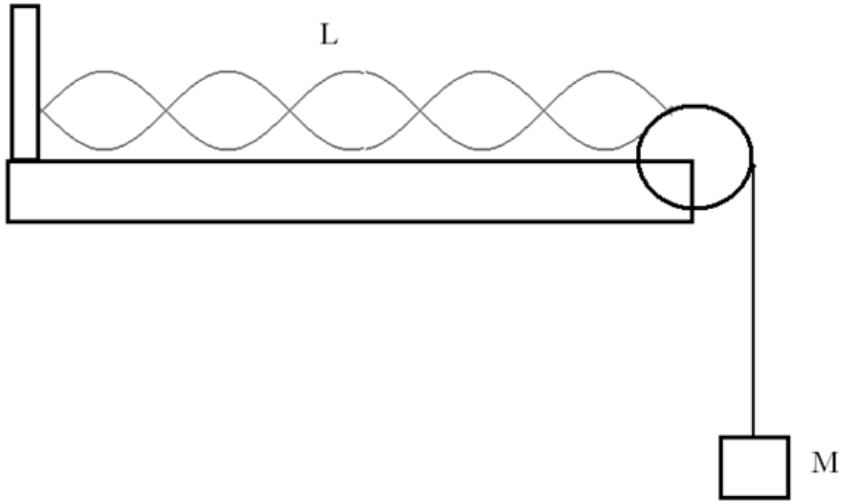
d. What will happen to the number of loops if the suspended mass is increased?

1. A string with a length of 2.5 m resonates in five loops as shown above. The string linear density is 0.05 kg/m and the suspended mass is 0.5 kg.



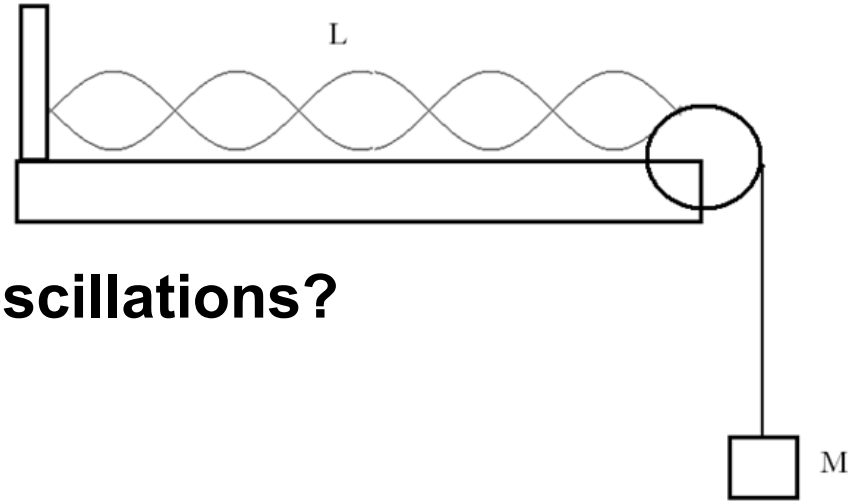
a. What is the wavelength?

1. A string with a length of 2.5 m resonates in five loops as shown above. The string linear density is 0.05 kg/m and the suspended mass is 0.5 kg.



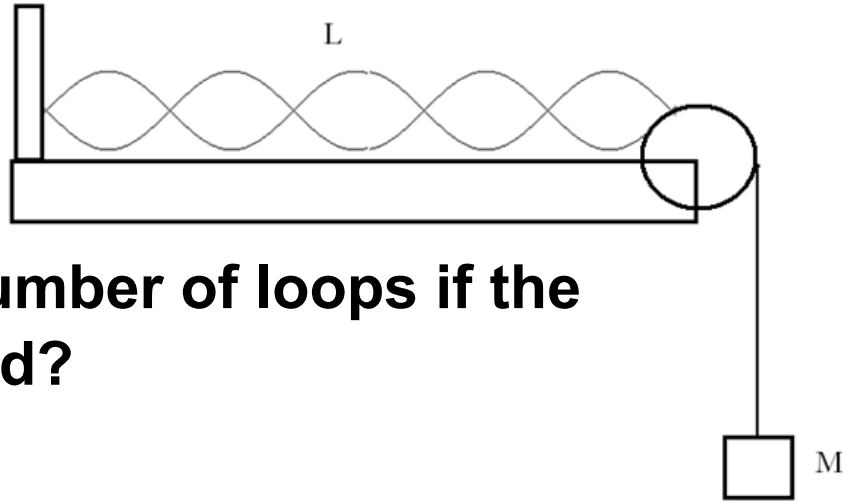
b. What is the wave speed?

1. A string with a length of 2.5 m resonates in five loops as shown above. The string linear density is 0.05 kg/m and the suspended mass is 0.5 kg.



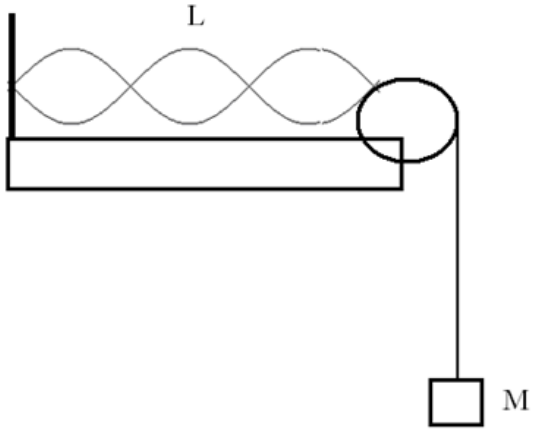
c. What is the frequency of oscillations?

1. A string with a length of 2.5 m resonates in five loops as shown above. The string linear density is 0.05 kg/m and the suspended mass is 0.5 kg.



d. What will happen to the number of loops if the suspended mass is increased?

2. A string with a length of 2 m resonates in three loops as shown above. The string linear density is 0.03 kg/m and the suspended mass is 1.2 kg.



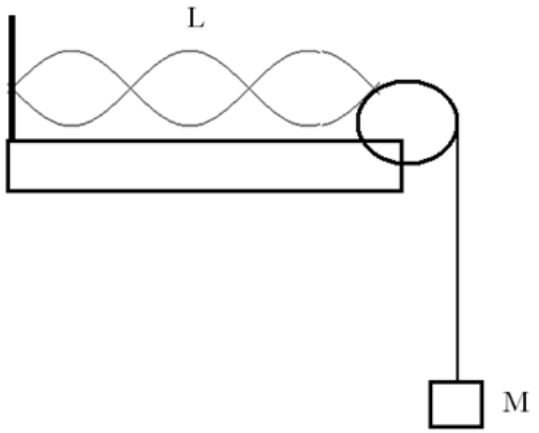
a. What is the wavelength?

b. What is the wave speed?

c. What is the frequency of oscillations?

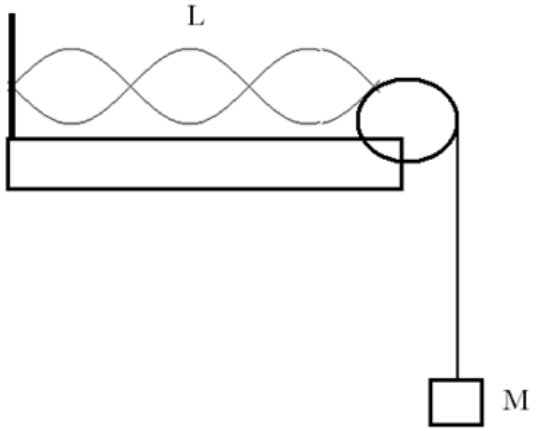
d. What will happen to the number of loops if the suspended mass is increased?

2. A string with a length of 2 m resonates in three loops as shown above. The string linear density is 0.03 kg/m and the suspended mass is 1.2 kg.



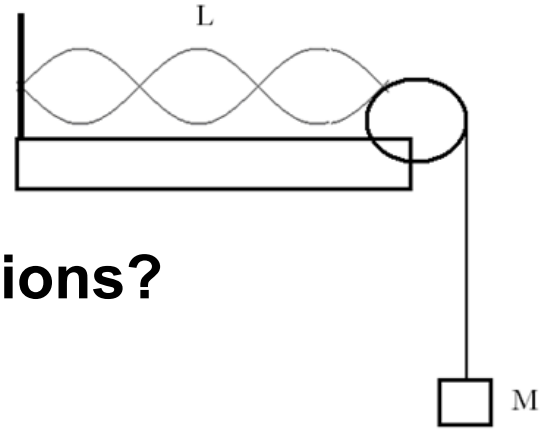
a. What is the wavelength?

2. A string with a length of 2 m resonates in three loops as shown above. The string linear density is 0.03 kg/m and the suspended mass is 1.2 kg.



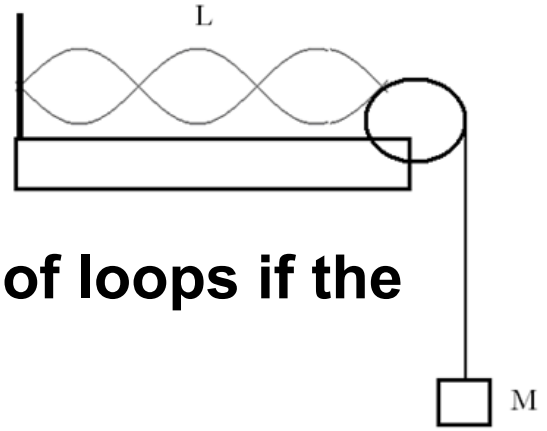
b. What is the wave speed?

2. A string with a length of 2 m resonates in three loops as shown above. The string linear density is 0.03 kg/m and the suspended mass is 1.2 kg.



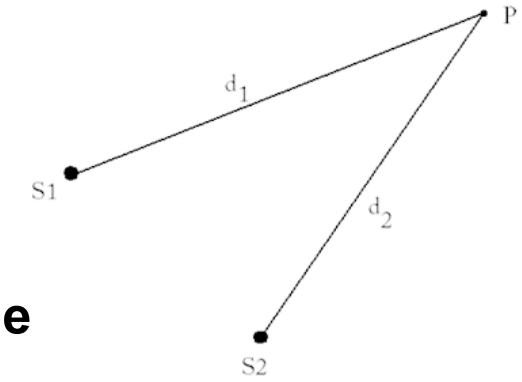
c. What is the frequency of oscillations?

2. A string with a length of 2 m resonates in three loops as shown above. The string linear density is 0.03 kg/m and the suspended mass is 1.2 kg.



d. What will happen to the number of loops if the suspended mass is increased?

3. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 1 Hz. The waves travel at a speed of 2.4 m/s. A point P is located 3.8 m from source 1 and 5.0 m from source 2.



a. What is the wavelength of the waves?

b. What is the extra distance traveled by the second wave before it reaches point P?

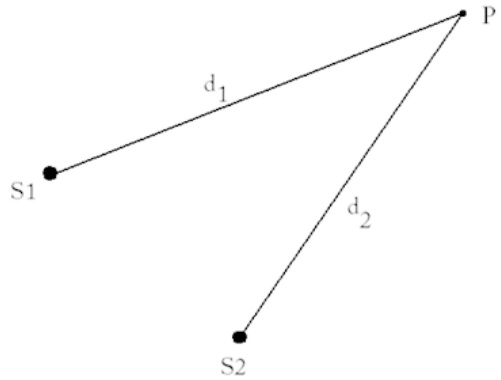
c. What is the result of the interference at the point P?

d. What will be the result of interference at the point P if source 2 is moved 3.6 m further back?

e. What will be the result of interference at the point P if source 2 is moved an additional 4.2 m further back?

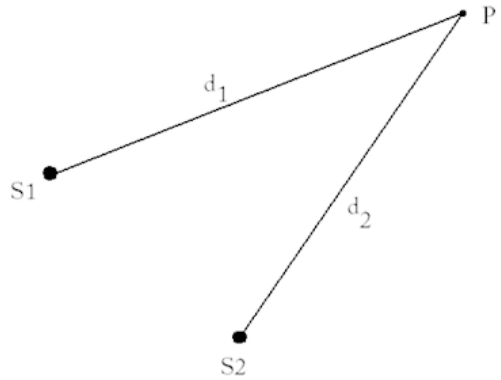
3. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 1 Hz. The waves travel at a speed of 2.4 m/s. A point P is located 3.8 m from source 1 and 5.0 m from source 2.

a. What is the wavelength of the waves?



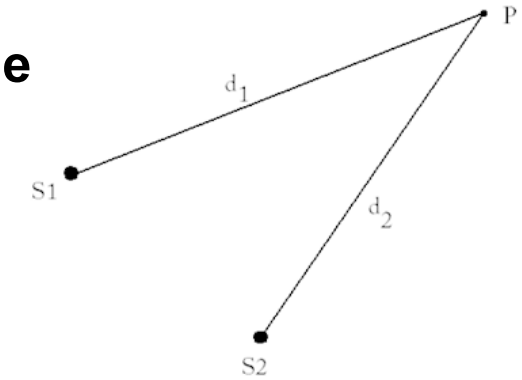
3. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 1 Hz. The waves travel at a speed of 2.4 m/s. A point P is located 3.8 m from source 1 and 5.0 m from source 2.

b. What is the extra distance traveled by the second wave before it reaches point P?



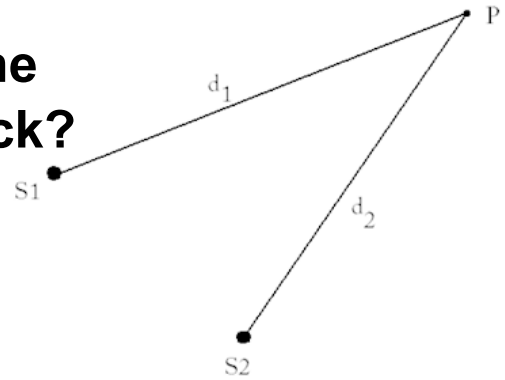
3. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 1 Hz. The waves travel at a speed of 2.4 m/s. A point P is located 3.8 m from source 1 and 5.0 m from source 2.

c. What is the result of the interference at the point P?



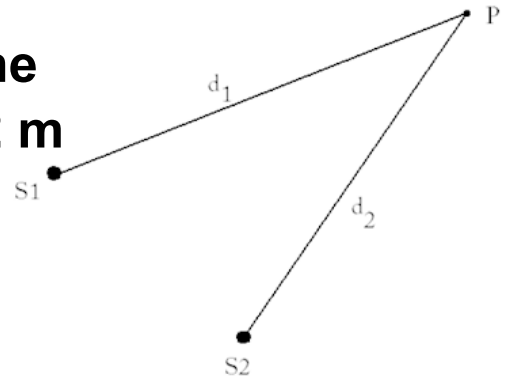
3. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 1 Hz. The waves travel at a speed of 2.4 m/s. A point P is located 3.8 m from source 1 and 5.0 m from source 2.

d. What will be the result of interference at the point P if source 2 is moved 3.6 m further back?



3. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 1 Hz. The waves travel at a speed of 2.4 m/s. A point P is located 3.8 m from source 1 and 5.0 m from source 2.

e. What will be the result of interference at the point P if source 2 is moved an additional 4.2 m further back?



4. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 4.0 Hz. The waves travel at a speed of 3.2 m/s. A point P is located 4.2 m from source 1 and 4.6 m from source 2.

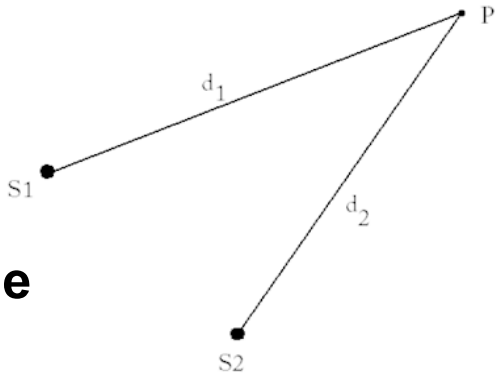
a. What is the wavelength of the waves?

b. What is the extra distance traveled by the second wave before it reaches point P?

c. What is the result of the interference at the point P?

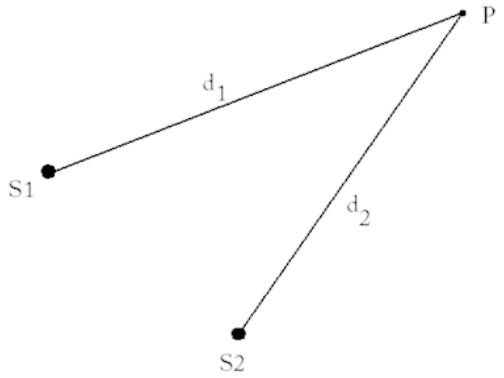
d. What will be the result of interference at the point P if source 2 is moved 1.2 m further back?

e. What will be the result of interference at the point P if source 2 is moved an additional 1.6 m further back?



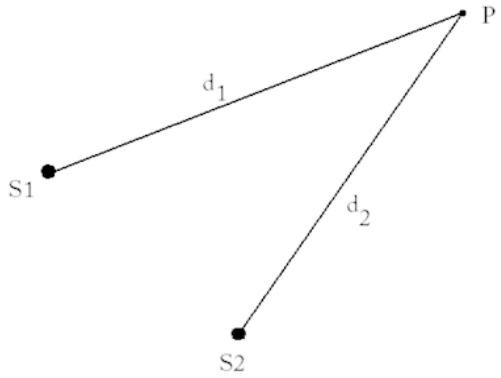
4. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 4.0 Hz. The waves travel at a speed of 3.2 m/s. A point P is located 4.2 m from source 1 and 4.6 m from source 2.

a. What is the wavelength of the waves?



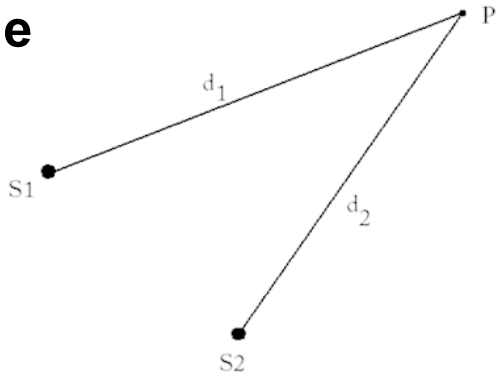
4. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 4.0 Hz. The waves travel at a speed of 3.2 m/s. A point P is located 4.2 m from source 1 and 4.6 m from source 2.

b. What is the extra distance traveled by the second wave before it reaches point P?



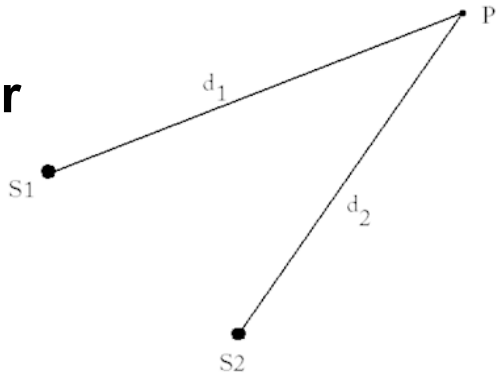
4. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 4.0 Hz. The waves travel at a speed of 3.2 m/s. A point P is located 4.2 m from source 1 and 4.6 m from source 2.

c. What is the result of the interference at the point P?



4. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 4.0 Hz. The waves travel at a speed of 3.2 m/s. A point P is located 4.2 m from source 1 and 4.6 m from source 2.

d. What will be the result of interference at the point P if source 2 is moved 1.2 m further back?



4. Two waves on the surface of water are generated by two independent sources vibrating at the same frequency 4.0 Hz. The waves travel at a speed of 3.2 m/s. A point P is located 4.2 m from source 1 and 4.6 m from source 2.

e. What will be the result of interference at the point P if source 2 is moved an additional 1.6 m further back?