WAVES: Sublevel 4

(1)

WM4 Wavelength-Frequency-Speed Relationship

Find the wavelength of a wave (in meters) whose frequency is 3.3 Hz and which travels at 10 meters/second. Enter a numerical answer.

(2)

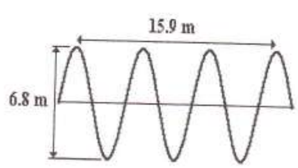
WM4 Wavelength-Frequency-Speed Relationship

Find the speed of a wave (in meters/second) whose wavelength is 4 meters and whose frequency is 3.5 Hz. Enter a numerical answer.

(3)

WM4 Wavelength-Frequency-Speed Relationship

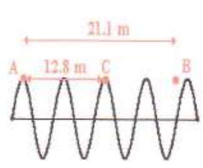
A wave with a frequency of 5.6 Hz is created in an elastic rope. The diagram below represents a snap-shot of the wave at a given instant of time. Determine the speed of the wave (in meters/second). Enter a numerical answer.



(4)

WM4 Wavelength-Frequency-Speed Relationship

A wave is created in an elastic rope. The diagram below represents a snap-shot of the wave at a given instant of time. The distance from point A to points B and C are given. Point A on the wave moves to the position of point B in 2.90 seconds. Determine the wavelength (in meters), frequency (in Hertz), and speed (in meters/second) of this wave. Enter numerical answers.



Wavelength = [ ] m Frequency = [ ] Hz Speed = [ ] m/s

(5)

WM4 Wavelength-Frequency-Speed Relationship

Two boats - Boat A and Boat B - are anchored a distance of 4.1 meters apart. The incoming water waves force the boats to oscillate up and down, making five complete cycles every 26.1 seconds. When Boat A is at its peak, Boat B is at its low point. There are never any waves between the two boats. The vertical distance between Boat A and Boat B at their extreme is 6.9 meters. Determine the wavelength (in meters), frequency (in Hertz), and speed (in meters/second) of the wave. Enter numerical answers. (HINT: begin with a diagram.)

##.##!

Wavelength = [ ] m Frequency = [ ] Hz Speed = [ ] m/s

(6)

WM4 Wavelength-Frequency-Speed Relationship

A pelican is sitting on its perch in the harbor as ocean waves come splashing in. The crests of the waves drench the pelican as it collides with its perch. The drenchings occur every 2.40 seconds. The crests are positioned 6.30 meters apart. Determine the wavelength (in meters), frequency (in Hertz), and speed (in meters/second) of the wave. Enter numerical answers.

##.##!

Wavelength = [ ] m Frequency = [ ] Hz Speed = [ ] m/s

WAVES: sublevel 6

(1)

WM6 Interference of Waves

Interference occurs when a wave ____.

a. crosses over a boundary into another medium
b. meets up with another wave traveling in the same medium
c. changes direction when passing from one medium to another
d. bounces off a surface
e. reaches the end of its medium
f. encounters an obstacle in its path

(2)

WM6 Interference of Waves

Constructive interference would occur when a ____. List all that apply in alphabetical order with no commas or spaces between letters.

a. trough of one wave interferes with a trough of another wave
b. crest of one wave interferes with a trough of another wave
c. crest of one wave interferes with a crest of another wave
d. none of these

(3)

WM6 Interference of Waves

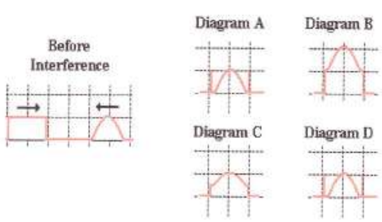
Destructive interference would occur when a ____. List all that apply in alphabetical order with no commas or spaces between letters.

a. trough of one wave interferes with a trough of another wave
b. crest of one wave interferes with a crest of another wave
c. crest of one wave interferes with a trough of another wave
d. none of these

(4)

WM6 Interference of Waves

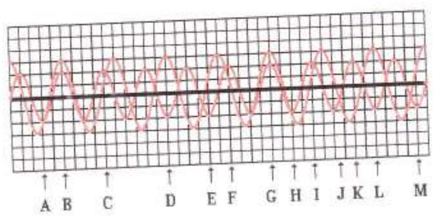
The diagram below right shows two pulses - a square pulse and a sine pulse - approaching each other along the same medium. Which diagram shows the shape of the medium when they are completely interfering?



(5)

WM6 Interference of Waves

The diagram below shows two sine waves present in the same medium; several points along the medium are labeled with letters. At which points does constructive interference occur? List all that apply in alphabetical order with no commas or spaces between letters.

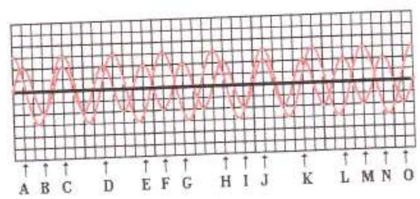


(6)

WM6 Interference of Waves

The diagram below shows two sine waves present in the same medium; several points along the medium are labeled with letters. The displacement of the resultant wave pattern at point J would be approximately ___ units.

a. 0	b. +1	c. +2
d. +3	e. +5	f. -1
g. -2	h. -3	i. -5

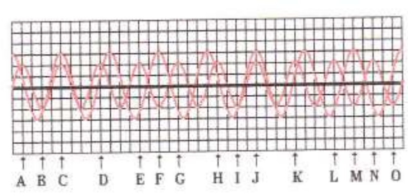


(7)

WM6 Interference of Waves

The diagram below shows two sine waves present in the same medium; several points along the medium are labeled with letters. The displacement of the resultant wave pattern at point O would be approximately ___ units.

a. 0	b. +1	c. +2	d. +3
e. -1	f. -2	g. -3	

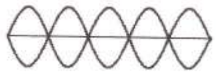


WAVES: Sublevel 7

(1)

WM7 Mathematics of Standing Waves

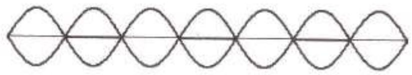
A standing wave pattern is established in a rope as shown below. If the wavelength is 1.2 meters, then the rope is ___ meters long. Enter a number into the answer field.



(2)

WM7 Mathematics of Standing Waves

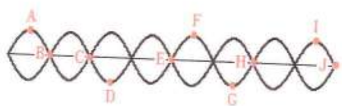
Consider the standing wave pattern shown below. There are ___ nodes and ___ antinodes shown on the pattern. Enter your answers in respective order as two integers with no spaces or commas between numbers. For example: '63' and '88'



(3)

WM7 Mathematics of Standing Waves

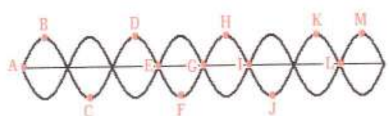
Consider the standing wave pattern shown below. There are several labeled points on the diagram. Point A is separated from point I by a horizontal distance equivalent to ____ wavelengths. Enter a number into the answer field.



(4)

WM7 Mathematics of Standing Waves

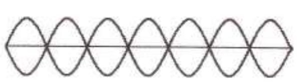
Consider the standing wave pattern shown below. There are several labeled points on the diagram. Point C is separated from point L by a horizontal distance equivalent to ____ wavelengths. Enter a number into the answer field.



(5)

WM7 Mathematics of Standing Waves

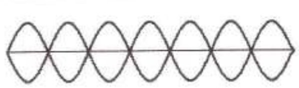
A young girl connects a rope to a tree and vibrates the free end in order to establish a standing wave pattern. The pattern is shown in the diagram below. There are ____ waves in this pattern, stretching from the girl's hand to the tree. Enter a number into the answer field.



(6)

WM7 Mathematics of Standing Waves

A standing wave pattern is established in a rope as shown below. If the rope is 4.2 meters long, then the wavelength of the wave is ___ meters. Enter a number into the answer field.

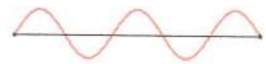


WAVES: Sublevel 8

(1)

WM8 Mathematics of Standing Waves

A standing wave is created in a 3.0-meter long rope by vibrating the rope 51 times in 4.1 seconds. The diagram below represents the standing wave pattern created for this frequency. Determine the wavelength (in meters), frequency (in Hertz) and speed (in meters/second). Enter numerical answers below.



Wavelength = [ ] m   Frequency = [ ] Hz   Speed = [ ] m/s

(2)

WM8 Mathematics of Standing Waves

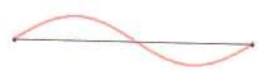
A standing wave is created in a 1.9-meter long rope by vibrating the rope 76 times in 9.9 seconds. The diagram below represents the standing wave pattern created for this frequency. Determine the wavelength (in meters), frequency (in Hertz) and speed (in meters/second). Enter numerical answers below.

Wavelength = [ ] m   Frequency = [ ] Hz   Speed = [ ] m/s

(3)

WM8 Mathematics of Standing Waves

A standing wave is created in a 1.8-meter long rope by vibrating the rope 62 times in 10.4 seconds. The diagram below represents the standing wave pattern created for this frequency. Determine the wavelength (in meters), frequency (in Hertz) and speed (in meters/second). Enter numerical answers below.



Wavelength = [ ] m   Frequency = [ ] Hz   Speed = [ ] m/s

(4)

WM8 Mathematics of Standing Waves

Jack and Jill create a standing wave pattern in a slinky by vibrating the slinky 24 times (i.e., 24 complete vibrational cycles) in 4.8 seconds. The pattern contains three loops between the ends of the slinky (the third harmonic). The slinky is stretched to a length of 3.7 meters. Determine the wavelength (in meters), frequency (in Hertz) and speed (in meters/second). Enter numerical answers below.

Wavelength = [ ] m   Frequency = [ ] Hz   Speed = [ ] m/s

(5)

WM8 Mathematics of Standing Waves

Jack and Jill create a standing wave pattern in a slinky by vibrating the slinky 27 times (i.e., 27 complete vibrational cycles) in 19.1 seconds. The pattern contains one loop between the ends of the slinky (the first harmonic). The slinky is stretched to a length of 4.6 meters. Determine the wavelength (in meters), frequency (in Hertz) and speed (in meters/second). Enter numerical answers below.

Wavelength = [ ] m   Frequency = [ ] Hz   Speed = [ ] m/s