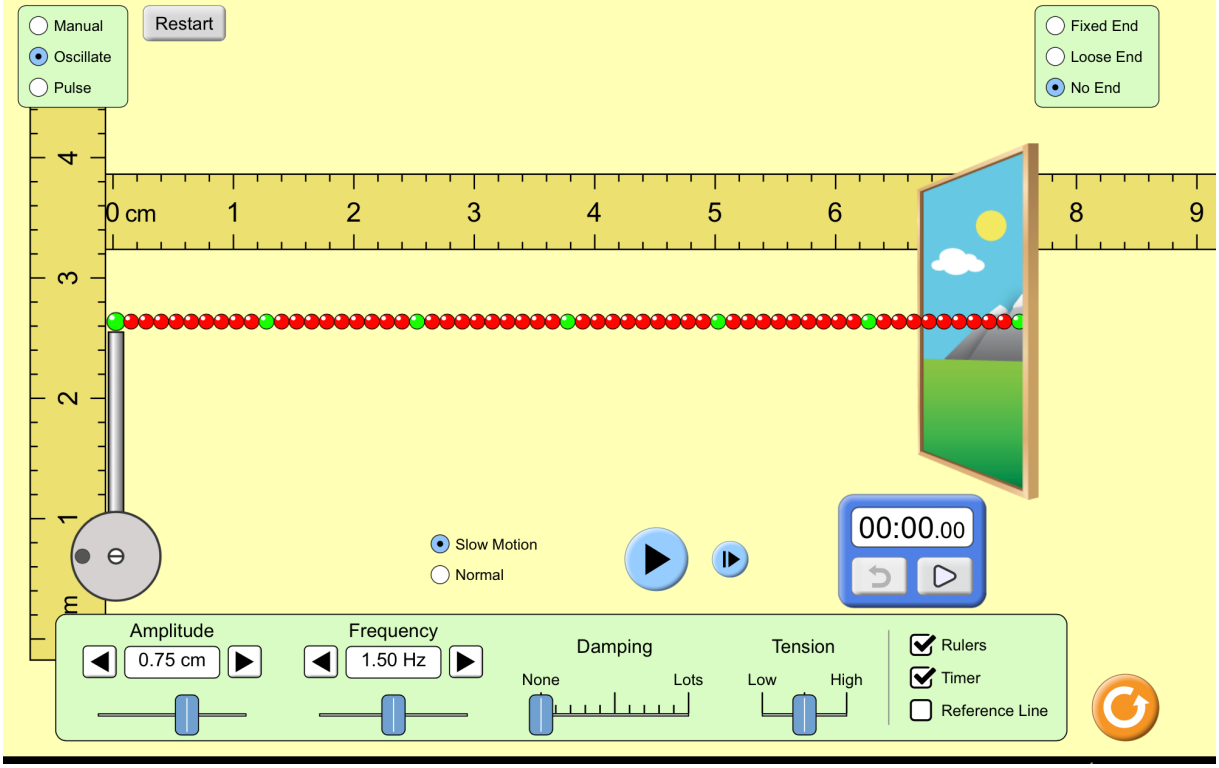
Daily Check 40

1. Go to this site: Wave on String PHET /2

   (If that does't work, use this site and click play: PHET link.)

   Set the controls as shown (and these are listed below also):



   - No end (in upper right)
   - Damping: none
   - Tension: 50%
   - Rulers and Timer selected
   - Slow motion
   - Oscillate

   Now answer the following.

   What is the maximum transverse speed for a particle in this wave?

   ◯ 3.7 cm/s
   ◯ 5.2 cm/s
   ◯ 1.1 cm/s
   ◯ 7.1 cm/s

2. Use that same site and the same settings. /2

What is the wavelength of the wave?

- ◯ 1.3 cm
- ◯ 2.5 cm
- ◯ 0.75 cm
- ◯ 1.5 cm

3. Use that same site and the same settings. /2

Which of the following is closest to the speed of wave propagation? Verify this using a calculation and also by literally measuring the time it takes a wave crest to travel a certain distance.

- ◯ 7.1 cm/s
- ◯ 3.8 cm/s
- ◯ 1.25 cm/s
- ◯ 4.4 cm/2

4. Use that same site and the same settings. /2

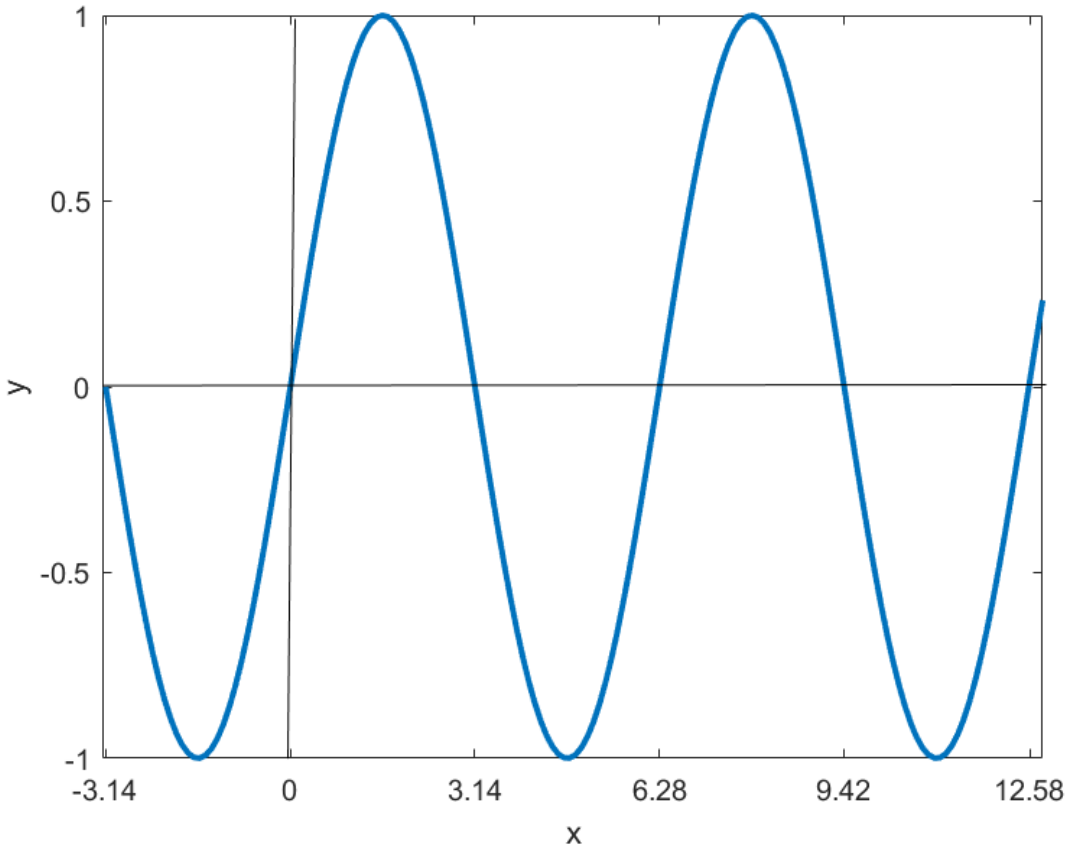
Which of the following is a correct statement of the equation for this wave, taking the phase to be zero?

- ◯ $y(x,t) = 0.75\ \text{cm} \sin\left((2.5\ \text{cm})x + \left(7.1\ \text{s}^{-1}\right)t\right)$
- ◯ $y(x,t) = 0.75\ \text{cm} \sin\left((2.5\ \text{cm})x + \left(1.5\ \text{s}^{-1}\right)t\right)$
- ◯ $y(x,t) = 0.75\ \text{cm} \sin\left(\left(2.51\ \frac{\text{rad}}{\text{cm}}\right)x + \left(9.42\ \frac{\text{rad}}{\text{s}}\right)t\right)$
- ◯ $y(x,t) = 0.75\ \text{cm} \sin\left(\left(2.51\ \frac{\text{rad}}{\text{cm}}\right)x - \left(9.42\ \frac{\text{rad}}{\text{s}}\right)t\right)$
- ◯ $y(x,t) = 0.75\ \text{cm} \sin\left((2.5\ \text{cm})x - \left(1.5\ \text{s}^{-1}\right)t\right)$

5. Which of the following wave functions describe a wave that moves in the negative x-direction? /2

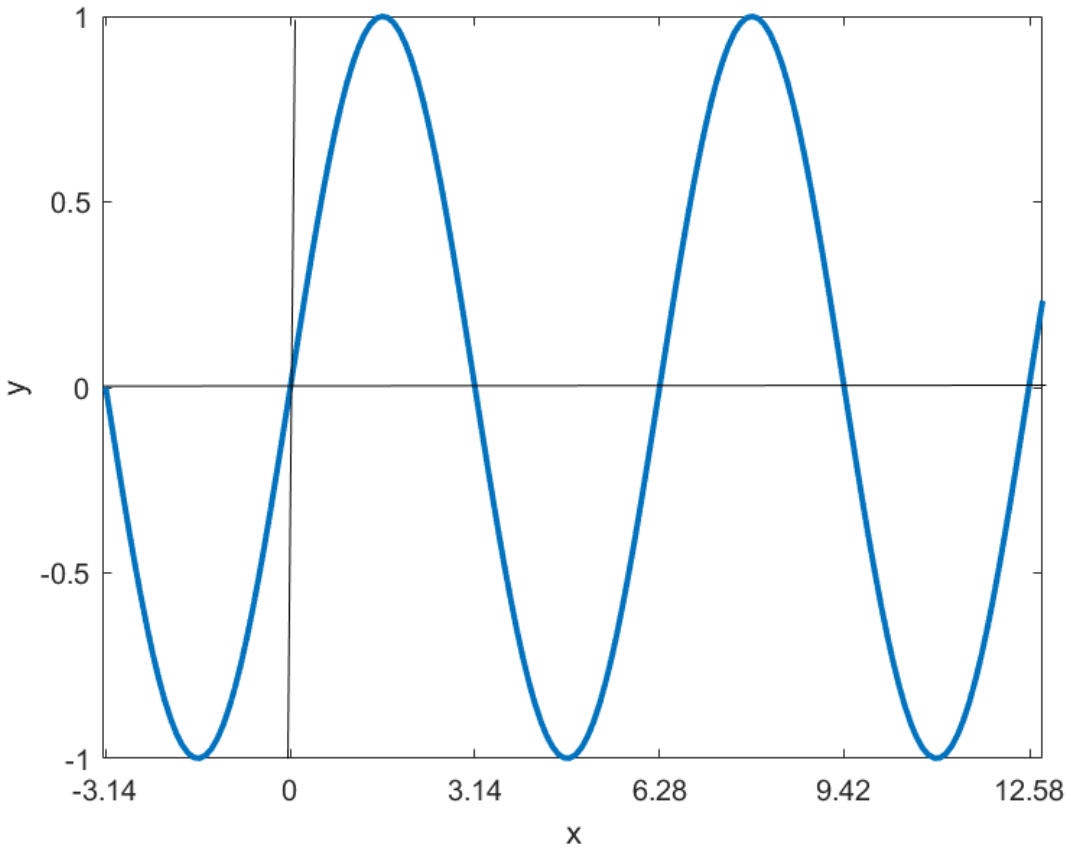
- ◯ $y(x,t) = A\ \sin(kx\ - \omega t)$
- ◯ $y(x,t) = A\ \sin(\ kx - \ \omega t\ + \varphi)$
- ◯ $y(x,t) = A\ \sin(\ kx\ + \omega t\ -\ \varphi)$
- ◯ Both A and B
- ◯ A, B, and C

6. Consider the waveform y(x) shown in the picture. What is the wavelength of this wave in meters? /2



- ◯ 6.28 m
- ◯ 1/6.28 m
- ◯ 3.14 m
- ◯ 1/3.14 m
- ◯ It cannot be determined from the graph

7. Consider the **waveform y(x)** shown in the picture . What is the **frequency** of this wave in Hz? /2



- ◯ 6.28 Hz
- ◯ 1/ 6.28 Hz
- ◯ 3.14 Hz
- ◯ 1/3.14 Hz
- ◯ It cannot be determined from the graph alone

8. /2

A transverse traveling wave on a string is given by the following equation in SI units:

$y(x,t) = 0.1 \cos(6x + 120t + 0.3)$

What is the maximum vertical (transverse) speed of a single particle on the string?

- ◯ 0.6 m/s
- ◯ 12 m/s
- ◯ 120 m/s
- ◯ not enough information

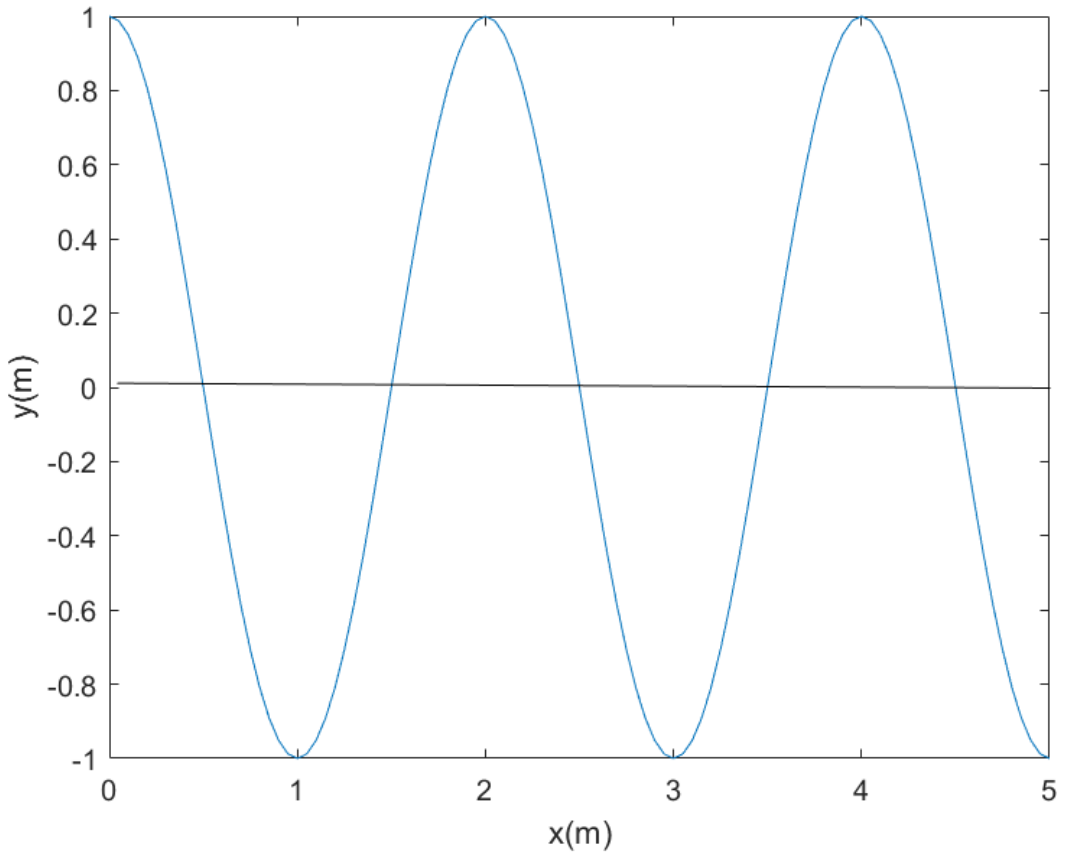
9. A transverse traveling wave on a string is given by the following equation in SI units: /2

$y(x,t) = 0.1 \cos(6x + 120t + 0.3)$

What is the speed of the wave?

- ◯ 12 m/s
- ◯ 0.6 m/s
- ◯ 120 m/s
- ◯ 20 m/s
- ◯ None of the above

10. For this sinusoidal wave moving at 200 m/s, what is the frequency? /2



- ◯ 50 Hz
- ◯ 100 Hz
- ◯ 200 Hz
- ◯ 400 Hz

11. A transverse traveling wave on a string is given by the following equation: /2

$y(x,t) = (0.1\,m)\,\cos(\,6\,rad/m\,x\, + 120\,rad/s\,t\, + 0.3\,rad)$

You watch a single particle on the string undergoing simple harmonic motion. What is the equation of motion for the simple harmonic motion for a single particle in this wave?

- ◯ $y(t) = 0.1\,\cos\,(120\,t + \varphi)$
- ◯ $y(t) = 0.1\,\cos(\,6\,t\, + \varphi)$
- ◯ $y(t) = 0.1\,\cos\,(6x\, + \varphi)$
- ◯ $x(t) = 0.1\,\cos(\,120\,y\, + \varphi)$

12. A wave travels through one medium (like air) into a second medium (like water). What quantity(ies) stay(s) the same? /2

- ◯ Speed only
- ◯ Wavelength only
- ◯ Frequency only
- ◯ Speed, wavelength and frequency are the same
- ◯ Wavelength and frequency stay the same