

# Midterm Quiz 1

**Due** Jun 27 at 11:59pm

**Points** 20

**Questions** 7

**Available** Jun 22 at 12am - Jun 27 at 11:59pm 6 days

**Time Limit** None

## Instructions

You have only one attempt at this quiz with an unlimited amount of time. There are several more questions than you normally have for a quiz. The questions here may be from your Pre-Lab questions and also cover material/questions from the lab itself. Your lab manual, any notes you have, and the lab powerpoint can be used to answer these questions.

## Attempt History

	Attempt	Time	Score
<b>LATEST</b>	<a href="#">Attempt 1</a>	76 minutes	6 out of 20 *

\* Some questions not yet graded

Score for this quiz: **6** out of 20 \*

Submitted Jun 26 at 11:33am

This attempt took 76 minutes.

### Question 1

**2 / 2 pts**

A 1.0 kHz sine wave travels along a string with a velocity of 371.0 m/s, determine the wavelength of the wave in meters, and give your answer to three decimal places.

Correct!

Correct Answer

0.371 margin of error +/- 0.05

### Question 2

**0 / 3 pts**

Given the following wave function  $y = A \sin\left(4.0 \frac{1}{m} \left(x - \left(5.0 \frac{m}{s}\right)t\right)\right)$ , where m is unit of

meters. Compare this equation to the equation given for a wave in your lab manual. Determine the frequency of the wave in Hz. Give your answer to two decimal places.

You Answered

236.1800

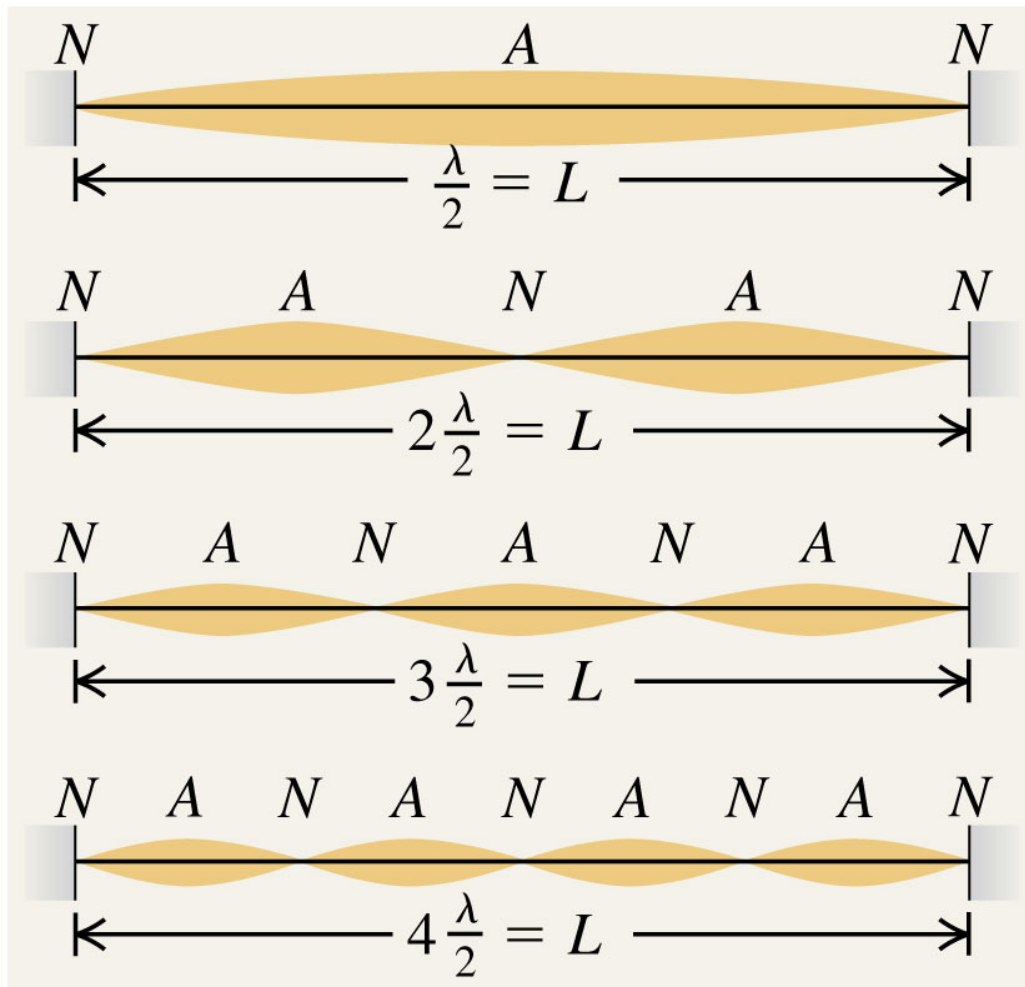
Correct Answer

3.18 margin of error +/- 0.1

### Question 3

2 / 2 pts

Shown in the image are the various harmonic modes for a standing wave on a string. What is the wavelength in terms of L for the 9th harmonic? Give your answer as a fraction.



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**Correct!**

(2L)/9

**Correct Answers**

2L/9

(2L)/9

(2\*L)/9

(2/9)L

2(L/9)

**Question 4****Not yet graded / 5 pts**

Describe in detail how a breadboard is connected. How will you go about debugging circuit errors? (ie if your circuit is not working, how will you check if the circuit is connected properly?)

Your Answer:

Bread boards have a "power strip" which has an array of positive and negative ins and puts. the power source is connected to this power strip.

Bread boards have multiple rows with holes to plugin jumper wires. The holes are connected by a metal strip (usually copper) on the underside of the bread board.

There is a center groove where components are included in the circuits.

The usefulness of breadboards are in their ability to be configured in virtually unlimited ways.

**Question 5****Not yet graded / 2 pts**

List at least 3 sources of error from either the Sound Waves lab, and the Standing Waves lab. State why it is a source of error, and whether or not it could be avoided. Make sure to state which lab it is from.

Your Answer:

In the standing waves lab, the structure was not perfectly fixed. Therefore the rod was susceptible to undesired oscillations. This undesired oscillation caused a immeasurable standing wave in the system. This immeasurable variable can account for inaccuracies in the collected data.

In the standing wave lab, another source of error can be due to the physical state of the pulley

system. An "imperfect" pulley can introduce friction or Torque that is unpredictable in the system.

In the standing wave lab, another source of error could be due to wear on the string. Over time the nylon string can become stretched. As the string is stretched it becomes weaker which leads to more stretching. Because the experiment depends on tension on the string, this micro scope stretching can lead to error/uncertainty.

In the sound wave experiment, data collection depended on many human factors including hearing. Identifying the ideal frequency is subject to interpretation by the humans conducting the experiment. This leads to error/uncertainty and a lack of perfectly reproducing the data source and collection methods.

**Question 6****2 / 2 pts**

Determine the length of the resonance tube in meters for a sound wave of wavelength 0.75 meters, given that  $L_{\text{corr}}$  is 2 cm, if the fundamental mode is resonating in the tube.

**Correct!****Correct Answer**

0.17 margin of error +/- 0.05

**Question 7****Not yet graded / 4 pts**

Describe in detail how a voltmeter must be connected to measure voltage across a circuit element. Describe in detail how an ammeter must be connected into a circuit in order to measure current. (The words "series or parallel" should be used as well as why they must be connected in this way). You have several resources to answer this question, including your textbook, notes, and the internet. Your answer must be in your own words.

Your Answer:

$V = IR$  (Voltage = (Current \* Resistance)

When discussing Voltage it is important to discuss "change in voltage" or "delta V"

To measure the overall "change in Voltage" of a circuit we should attach the red wire from the voltmeter to the beginning of the circuit (right after the power supply) and the black wire to the end of the circuit (right before the other end of the power supply). Similarly to measure the change in voltage across a circuit element, the volt meter should be connected (in parallel) right before the element and right after.

$$I = V/R$$

Current is usually measured in Amperes. To measure the current through a circuit. The Amp meter needs to be "looped in" to the circuit. Basically the ammeter needs to be connected "in series" to the circuit. This means that all the current will flow through the device.

Quiz Score: **6** out of 20