OSU Academic Integrity Statement

During this quiz you are not to receive information, nor communicate with anyone, about the form, content, length, or difficulty of this quiz. Additionally, you are not to use any unauthorized resources while taking this quiz.

The allowed resources are: any notes you have collected during this course (handwritten, printed, or saved locally on your computer), blank sheets of paper or a digital tablet, writing utensil, a ruler, a protractor, and a non-communicating calculator. **Accessing the internet** while taking the quiz for any reason other than downloading, viewing, or turning in the quiz **is strictly prohibited**.

Receiving information or discussing details about this quiz between the time of its release and a time 48 hours later is stickily prohibited and is in violation of Oregon State University's Code of Student Conduct.

https://studentlife.oregonstate.edu/studentconduct/academicmisconduct

Any incidence of academic misconduct will be dealt with in accordance with Oregon State University's policies.

By submitting your work to Gradescope, you are stating that you have abided and will abide by the rules stated here and the academic integrity statement found in the syllabus on boxsand.org.

Physics 203

Weekly 2 quiz | Corvallis Campus

4/7/2021

Collaboration is not allowed. You will have 25 minutes to download this PDF, solve, take pictures, AND upload this exam to Gradescope. You will have an additional 5 minute buffer in case technological issues arise.

Anna and her cold tempered sister want to measure the dimensions of the rectangular theater in which they will be performing. They stand side by side on the stage, two meters apart. Both of them sing a perfect high C (C_6) note at 1046.5 Hz out into the theater. They have enlisted you to help them measure. You pace out a distance of 50 meters from the sisters to the back of the theater, but as you try to measure the full width of the theater, you lose count of your steps. However, you remember that you heard the high C note get louder 7 times during your walk across the full width of the back of the theater. You also remember that on either edge of the theater, the note was rather quiet. (hint: the speed of sound is 343 m/s)

(a) Not wanting to be encased in ice, you inform the sisters of the theater's width. What is the width of the theater? Make sure to include one or more physical representations (diagrams) of the situation!

(b) Is your answer reasonable? Make an order of magnitude sensemaking argument for (or against!) the reasonableness of your answer.

(c) If you wanted to hear more loud and quiet areas across the back of the theater, would you move the sisters closer together or further apart? Explain why.