

Chat Information

Chat Title

Week 9, Day A live chat

Session Information

Start Date

Mar 23, 2020 8:33 AM

End Date

Chat Text

Session Started

joined the chat.

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Good morning! I'll be back in a few minutes --- just putting final touches on some material.

joined the chat.

joined the chat.

How is everyone doing?

(Yes, please use this time before class to chat amongst yourselves)

Amid social distancing I mean, is everyone okay?

Lonely and boring. Just hoping classes go well...

My wife and I used to meet with neighbors and acquaintances at our local coffee shop.

Now we can only wave to people when we go for walks. Rats.

You still living with Nick or are you back in MA Ashley? And yes professor I've seen a lot

of people spending time together from a distance

I don't know if everyone saw the email from RIT but we can change our classes to pass/fail up until the last day of classes. I'm personally very happy about that considering computational learning online is difficult

joined the chat.

If the class is pass/fail it won't affect your GPA, in case anyone was wondering

Yes. The pass/fail option is completely under your control as students. I, and other faculty, will compute and assign letter grades in the usual way, and submit them to the registrar; then, the registrar will convert to pass/fail, if you have chosen that option.

Nick got laid off while this mess is going, so yes. Both. As for the time together from a distance, I keep seeing people walking together on opposite sides of the street....

joined the chat.

Two days ago, as I walked down the sidewalk, a mother pulled her two children off the sidewalk as I approached. I told her that I would face away from them all when I walked past, and hold my breath. She laughed

joined the chat.

Also I was wondering, I had read the lecture for today on Friday just to try to get a feel for how this would work, but either I was not paying attention, or a bit was added at the end. I am wondering if that is something that would happen often, and if so when should I check for the most up to date?

Yeah I've noticed if you walk too close to someone in a grocery store or walking down the street they jump away from you

joined the chat.

Yes, I've added a couple of bits to today's lecture material. It is not new material; instead, it's simply some attempts to connect the material for today with material you've seen in the past. In other words, I'm just trying to help by adding stuff I might have said verbally in class.

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joined the chat.

joined the chat.

OK cool, I was just confused. But I feel like confused is going to my normal mode for a few days....

I am also confused these days. We should form a club :-/

joined the chat.

Yayyy the confused quarantined club!

joined the chat.

I'll try to start the official class at 9:01 AM. We can all be social until then ...

joined the chat.

joined the chat.

Sounds good, I hope everyone is healthy and that I'm not the only one who is nervous

joined the chat.

joined the chat.

Also good luck in everyone's bizarre new class set-up's. Either as the teacher or student, good luck!

joined the chat.

joined the chat.

joined the chat.

joined the chat.

Any word or estimates as to how long this will last?

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joined the chat.

This set up? It's for the rest of the semester

How long what will last?

Alternate modes of delivery for every class

joined the chat.

joined the chat.

This feels so strange.

The rest of this semester.

joined the chat.

joined the chat.

I'll "start class" in one minute, everyone.

This really is strange

joined the chat.

joined the chat.

I believe the current hope is to have the virus controlled during summer...

So we will not be having an audio chat for class time?

I really hope that this gets under control

Yeah things are cancelled all the way through May

joined the chat.

@Pieter: I will explain in a moment.

Okay, everyone, welcome to our first on-line meeting of PHYS 283.

joined the chat.

Please give me a few moments to explain how things will work today and over the next few days.

joined the chat.

First, let me verify that our TA, Matrecito-sensei, is with us. Could you say "hello", please?

joined the chat.

Hello :)

Thank you! Note that she and I are using different colors for our names, to help you see our comments.

During today's (brief) lecture, I'd like you all to do the following if you have a question: type "Q" and send it into the chat. Matrecito-sensei will note it down, and she will act as a moderator.

We'll see how well that works. This is just an experiment.

First, please make sure you have read the material at <http://spiff.rit.edu/classes/phys283/online.html>

joined the chat.

That describes the plan for how this class will be run moving forward.

joined the chat.

There will be

- a) homework as usual
- b) quizzes, one per lecture, on the WebWork system
- c) tests -- one more test next week, and the final exam

joined the chat.

So, basically, the same breakdown for grades. Yes, extra credit projects are still accepted.

Next, I will continue to hold office hours via the "Zoom" tool at the usual times.

Matrecito-sensei will also hold office hours via Zoom.

joined the chat.

Q: can you explain a bit more about how exams will go?

Her office hours are Tue/Thur 1-2 PM --- is that right?

joined the chat.

joined the chat.

@Ashley: yes, I'll try to explain how the test and exams will go.

joined the chat.

joined the chat.

The plan is for me to give you a "practice test" later this week.

Q: Is it possible to hold lectures through Zoom?

That will be something like one problem in the ordinary test format. I'll ask you to write out your answers on paper, as you would normally, and then scan/photograph it and send the results back to me (details to be explained in the next few days).

I suspect that this won't be a useful way to take tests, but I want to verify how badly it works :-{

If it's feasible, I'll go ahead and give a "regular" test 2 next week: 4 problems in the usual format. You'll have many hours to work out the answers and scan the results, then send them to me via E-mail.

I suspect that won't work. In which case I may make Test 2 a multiple-choice format. That multiple-choice format test would be administered via WebWork.

There will be complications, and I'll try to use the practice test and Test 2 to figure out the best way to do things.

As with everything, I'll be learning what works and what doesn't the hard way. As will you.

Q: Will there be any change to how the final grade will be weighted? For example, the final can replace one of the term tests?

Please give me lots of feedback!

(pause for a moment to ask -- have there been student questions?)

(is hard for me to type and read at same time)

Pieter (pjb8094): Q: Will there be any change to how the final grade will be weighted? For example, the final can replace one of the term tests?

Yes. The final exam can replace either of the two tests, if it has a better score.

I will make a note of that on the "outline" for the course.

(any other questions so far?)

Akif (aq7500): Q: Is it possible to hold lectures through Zoom?

In theory, yes. I am working on a setup here at home that might allow me both to share my screen, and to write on a paper. Is not so easy. We'll try it Wednesday for class and see how it goes.

Okay, that's all for questions for now. TIME FOR TODAY'S LECTURE.

This going to be very brief. I want to try one technique today, and see how it works.

Please give me your feedback BY E-MAIL over the next 24 hours.

This technique is -- to provide a brief summary of the material for the day, and then to ask you to read the material on the course webpage for today.

I have created a "quiz" for today in WebWork. There are multiple-choice questions which can be answered by reading the material.

I understand that this not the same as listening to me talk over the material for 50 minutes, but I want to find out just how different it is.

Today is a good day for this experiment, as we will go over very similar material in Friday's class 9C.

So, here's the executive summary of today's material -- pay attention :-)

Executive summary: We can use the methods we've developed for dealing with multiple masses connected by ideal springs to figure out the behavior of a long, thin string stretched between two pegs. If we break that string up into lots of little segments, and consider the forces exerted on each segment by its neighbors, we can derive two important features of oscillations of the entire string:

joined the chat.

1) the SHAPE of the normal modes of oscillation are simply sine curves with an integer number of antinodes between the pegs

2) the FREQUENCY of the normal modes of oscillation rises linearly -- at first -- with the number of antinodes

These two conclusions should be very familiar to you, since you saw them back in UP I

All the material in today's lecture is devoted to deriving these two conclusions.

We start with the basic technique of computing the normal modes of oscillation for two masses connected by two strings -- which we have practiced over the past few weeks of class

and then break a long string into lots of tiny little pieces.

By considering the behavior of three little pieces, we can figure out some relationships between the motions of all the pieces in the string.

joined the chat.

And then we use LOTS of math (some of it pretty obscure, I admit) to figure out properties of the entire string.

That's it, really.

I don't think it makes sense for me to try to explain things step-by-step in this format ... by that's part of today's experiment.

Maybe it does make sense for me to go step by step through the entire lecture. I will try something like that on Wednesday.

But I want to see how it works if I give you this basic summary, and ask you to read it over for yourself.

I've added a couple of pictures from a UP II lecture to remind you that the results we get

today are results you've seen before.

Q: the lecture has lots of sines and cos's, we use radians correct?

I hope that this will help you to see the connections that can be drawn between material in PHYS283 and earlier classes.

Yup -- use radians, not degrees.

Q

So, please ask questions now!

Q: Is this chat saved in a way that we can look back at it later?

(the rest of this class period will be me answering questions)

Q: Can you talk a bit more about the angle "alpha" from the lecture notes? I'm not exactly sure what it's being defined as and how it's being used

@Jonathan: I sure hope so! I will try to save the chat and put a link to it on today's course webpage.

@Chloe: You have asked the toughest question of the day --- good work!

The basic idea is that the string is attached to a peg at the left end, and a peg at the right end.

In the simplest normal mode of oscillation, the string goes up toward a peak in the middle, and back down to the peg at the other end.

(sorry, double post)

That means that the position of each little section of the string, as we move from left to right, will be first a bit higher than its neighbor on the left, then about the same, then lower than its neighbor on the left.

Q: Near the end of the lecture with the two questions, there aren't answers. Will the answers to those be up soon?

If we draw a line from "neighbor on left" to "little segment in the middle", and another to "neighbor on the right", we'll see that those lines have some angle above the horizontal.

The key for today is finding a relationship between these angles -- in other words, finding out how quickly the string is rising toward the middle, or falling toward the right end.

joined the chat.

We could try to express this angle between adjacent segments as an explicit value -- like "0.001 radians" or something.

But it will turn out (this is one of those cases where smart people in the past have found the right answer and then tried to find a simple way to explain it)

that if we instead say "oh, we could express the tilt of the line between adjacent segments as the sine of some OTHER angle alpha"

then it will turn out that the relationship between the position of adjacent segments will end up being very convenient.

Very convenient, that is, because we can show (using trig identities and algebra that I would never have thought of using)

that the positions of adjacent little segments of string must be described by an overall sine-wave-like shape, from one of the end of the string to the other.

I'm sorry for all those words, but your question hit on the hardest part of today's material, I think.

I guess the short answer is -- if one chooses to use a complicated way of describing the angles between adjacent segments, then the result ends up being pretty simple.

Does this help at all?

Q; So this angle alpha is referring to a given mass's angle with regard to a peg (in this case the left)?

Here's the next question by the way:

Michaela (mrc9993): Q: Near the end of the lecture with the two questions, there aren't answers. Will the answers to those be up soon?

(I am waiting for @Chloe to answer)

Yes, thank you!

@Michela: Yes, I can put answers up -- done.

Tyler (tjr6518): Q; So this angle alpha is referring to a given mass's angle with regard to a peg (in this case the left)?

Well, partial answers, anyway. I want to leave a little of the work to you. Please ask me questions if you don't know what to do.

@Tyler: Here's how alpha is defined. The very first segment to the right of the left-hand peg is defined to have a vertical position

$y = C \sin(\alpha)$, where "C" is some constant giving the maximum vertical amplitude of the middle of the string.

Then, the next segment of string is defined to have position

$$y = C \sin(2\alpha)$$

And the third segment has position

$$y = C * \sin(3\alpha)$$

and so forth.

Right, makes sense

So alpha is not exactly the angle of the line segment itself ... but it's related to it.

And if you describe things in this somewhat convoluted manner, it turns out that the later analysis of the entire string will be simpler.

These are very good questions, by the way -- you students are finding the difficult portions of today's material!

(any other questions?)

Ok, got it, thanks!

Q: It seems like alpha is being treated as horizontal distance - like how on our calculators we would type in $y = \sin(X)$, and that X is the position along the x axis - except it's horizontal distance as a fraction of the distance between the pegs. Is this a fair statement, or is it flawed?

Hmmm. Give me a moment to think about that.

The "C" in the expression

$$y = C \sin(\alpha)$$

has units of length. So alpha itself really is an angle, in radians.

But your idea of alpha being related to the fraction

vertical displacement / distance between segments

is a good one.

Q: What we're ultimately to describe with this is an infinite number of oscillators?

We make the approximation in today's analysis that the string is ALMOST horizontal, so that the angles are all small.

And that means that

$$\sin(\alpha) \approx \alpha$$

and so alpha is like a fraction of distances ... so, yes.

Q: Would it also be correct to think of "alpha" as a sort of "wavelength"? As in, if we assume the shape of the string looks like a sine wave, then as 'p' ranges from 0 to N, the amplitude of each block must follow a $\sin(p \cdot \alpha)$ where 'p' almost acts like 'x' and alpha acts as the "wavelength" for determining the shape of the sine wave. That would also

make 'C' the maximum amplitude of the wave in that case

joined the chat.

joined the chat.

@Jack: Yes, the goal of today's entire lecture is to extend our basic analysis of 2 or 3 or 4 oscillating masses connected by strings, to a nearly infinite number of them.

@Chloe: I think your idea has merit.

C is indeed the maximum amplitude of the wave.

But I'm uncomfortable using "Wavelength" as a way to describe alpha. It's an angle, or a fraction ... not a length. At least in my mind.

Ok, thank you

We have 4 minutes of class left. I will go to a Zoom session for office hours 10 - 11 AM today.

If you look at the "Zoom" item at top of myCourses webpage for this class, it should take you to a list of Zoom sessions. You can join there if you wish.

Q: Can you reiterate how to join your zoom video?

If everyone joins, it will be chaos with 60 people talking at once. I guess we'll have to see what happens.

Do not forget to complete quiz_9A in WebWork -- you have three hours!

Zoom session direct link (if you don't see on myCourses under Zoom) is

<https://rit.zoom.us/j/549504566>

I will be there from 10:00 AM to 11:00 AM this morning.

left the chat.

Matrecito-sensei will have Zoom office hours tomorrow 1-2 PM.

left the chat.

See you all Wednesday at 9 AM! Send me E-mail if you have questions/problems.

Bye-bye.

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Have a great day!

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