1 Weverton:
2 Alright, so Kelly, tell me what motivated you to pursue a PhD in mathematics?

3 Kelly: I think math is super fun. That's one of my favorite subjects. And I really liked it a lot. And I've always kind of wanted to teach it. Like when I was in, you know, Middle School, I want to teach middle school math, and I was in high school I wanted to teach high school math. Then in college, I was like, No, this is way better. I want to teach college math [laughs]. And so then I knew I needed a PhD in order to do that. And then I hit grad school and was like, yeah, so on to teach college math. So Yeah,

4 Weverton: Nice. So that clicked for you? Like, I mean, like, you knew you needed that PhD? Because you want to teach college? [Kelly: right, yeah] Correct? Yeah. Can you tell me about the strongest filling you have experienced as a mathematics student?

5 Kelly: the strongest feeling?Probably like joy or excitement.

6 Weverton: joy or excitement? Can you tell me more about it?

7 Kelly: Yeah, Um, I really like seeing how things work. I like watching the logical process. And just kind of seeing, yeah, how the sort of thought process goes. And that's a lot of fun for me. And

8 Weverton: Was there a specific moment where you felt like a very strong feeling?
9 Kelly: Um, I guess The moment that I knew I should do like a math major and go to grad school as in my calculus two course. I don't remember what exactly we were doing in the calculus two course. But I just remember thinking that it was really cool. And in that course, to the professor gave us a lot of proofs for what things worked. And seeing that just got me really excited. I don't remember too much more specifically than that course.
10 Weverton: All right. So can you recall the last time you talked to someone about being PhD student in mathematics?

11 Kelly: [thinking] I've been talking about this with people a lot lately, actually, because I'm working on switching my dissertation topic. So I was doing it an abstract algebra. And now I want to do it in the more education side on undergrads and proofs. And so a lot of the education students have been asking me. So are you moving to our department? And I'm like, No, I'm staying in the math department.
12 Do you mean more like explaining what it's like to be a, [Weverton: it could be] math grad students.

13 Weverton: Or we could also talk about these experience of thinking about like, changing the topic of the dissertation. [Kelly] Yeah, both ways. Okay. So Tell me more about it. Like what happened that you decided to change?

14 Kelly: Yeah, Um, so I like to abstract algebra well enough to force myself to keep going. But I've always been more interested in like the teaching side, and like the students learning and that sort of thing. But the information I was given was that if I did my PhD in the education side, then I would be teaching courses to teachers. And then I wouldn't get to teach the math courses and what I really want to teach is the math courses. And then I found out recently, that solid portion, I don't remember the exact number of maybe like a quarter to a third of the education PhDs here get to go teach math courses at small schools. And one of my friends actually did that. He just graduated recently, and is now teaching all math classes at a small college. That's like, well, wish I know this sooner. But yeah, why not switch the dissertation to something I'm a lot more interested in.
15 Wevert: Interesting. So and how does the support happens? Because I'm trying to understand how you gonna be advised by a mathematician to in order to develop that educational background about teaching.

16 Kelly: Right? Yeah, there is one person has a joint appointment between both departments, Rachel Kenny. And so she agreed to take me on as a student, which was really amazing of her. I wasn't really expecting that I thought I might have to switch departments. And I was talking to them about that. And I was saying, like, I know, you might be nervous, because right now, I'm all but dissertation. So maybe you're, you know, nervous about taking me on if you're thinking that I can't focus on a topic. But she was like, well, let's talk about if I can work with you. And then you could stay in the math department, and you wouldn't have to go through the whole process of changing departments. So Yeah.

17 Weverton: So If you meet up with a student who was thinking about taking a PhD in math, what device or experiences could you share to help them make up their mind?

18 Kelly: Right? Um, I think first, I would ask them about their goals, career wise. Yeah, like, Why? Why are they considering a PhD in math. And then I might also kind of ask about what they thought about their upper level courses, like the real analysis or abstract algebra. Then, I find out that they really didn't enjoy those courses that a PhD in math is going to be rough.So Yeah, I probably asked for that kind of thing. And then the last thing that I would want to check with them to in order, if you know, they're really convinced they want to go to grad school for math, I'd ask them about what kind of environment they like to work in, and tell them ways that they can find out about the environment in the school, like by contacting the grad students to find out if it's more collaborative, or more competitive, That sort of thing.

19 Weverton: Why you think about the environment? Is there anything specifically that links to like, the way you look at it? Or do you like it to be?

20 Kelly: Yeah, I think that the environment says a lot, or it'll have a huge impact on how the student performs, you know, if they like to work with others a lot. And then they go to a school, where people tend to work on their own and are really competitive, like, it's going to be hard for them there. Versus like Frank University, we all kind of work together, we more kind of take the approach of, you know, no one has to fail the exam, we could all pass. So let's all work together to pass that type of thing.

21 Weverton: Do you think there is any specific reason why it happens this way in Frank Univerisity? like this idea of working together everyone encouraging each other to pass exams.

22 Kelly: Yeah, I'm, I don't know how it got started. I think it's continued this way. Because that's very much the message that we put out to prospective grad students, we tell prospective grad students that we like to do that a lot. And so I think there's a little bit of maybe some self selection going on, there were grad students who want that come here, and then they all work together. One other thing our department does, which is actually happening right now is the t and cookie time, which is every day of the week, and the grad students and professors will just stop what they're doing and go talk to each other, Sometimes about life, sometimes about math. And so I think that helps a lot to sort of build the community here. So people aren't just sitting in their office working on their own.

23 Weverton: All right, what about your experiences like specific experiences, you would tell the students to help them to make up their mind, whether they should study a PhD in math.

24 Kelly: um, like my experiences in grad school, or my experiences, when I was deciding, go to grad school, [Weverton: in grad school] in grad school,[thinking] I think I want to tell them, about how classes sort of taken another jump in terms of difficulty, just so it's something they're prepared for. I felt like I was really well prepared by my undergrad. Actually, I didn't feel like my first year of classes was all that bad. But I know some other people really struggled their first year of grad school, that it was just a lot more abstract than anything they had seen before. And a lot more detail oriented than anything they had seen before. Another thing I could tell them about was my first year I took in my second semester, I was trying to figure out a research topic as soon as I could. And I took this algebraic topology course. And the professor asked us if we knew any

category theory, and one person raised their hand, and the professor goes, Oh, I was planning on teaching this course from the perspective of category theory, and then proceeded to teach the course from the perspective of category theory. So that was rough. I kind of just crossed algebraic topology off the list of possible topics, because we were trying to take the course and learn the topology and learn the category theory all at once. And it didn't go so well. So, yeah, I guess I would also kind of warn them that if they're coming from a small school like I did, where my professors were all very good as teachers and instructors, kind of warn them that they have to be ready to learn more from the book. And they might not be able to rely on the lectures as much.

25 Weverton: All right, So can you think about so far, what has been the most memorable aspect of your PhD?

26 Kelly:[thinking] I think I have two things. A good thing and a bad thing. [Weverton: All right] So The good part is just having interesting courses with really good professors who laid out this whole new level of math that I didn't know was out there. Like, yeah, learning about abstract algebra and modules, and all sorts of things like that, that I had no idea sort of how deep math could go until coming to grad school. That was really great. And I had like two particularly good professors one and algebra one and analysis where it was just amazing to see where we could go with math. The bad part was the advanced topics exam here, which takes our version of the prelim. My advisor gives one of the hardest ones here at Frank University. And my advisor at the time before I switched dissertation topics gives one of the hardest ones. So it was over three courses worth of material. And I had to stand up in front of the board and just answer What they asked about anything from those three courses. I was really stressful. And I did not do well. Like I just got so flustered and nervous. I couldn't think clearly. And they were they were kind about it, they, you know, sort of helped me through it. And I passed at the end, you know, so it worked out. Okay. But Yeah, that was the worst memory. So far.

27 Weverton: Why was it hard? Was it because of the amount of things you learned?
28 Kelly: I think so that it made me stressed ahead of time. I know, I partly psyched myself out going into it. But just the sheer volume of what we needed to know was rough, especially because my advisor didn't just want us to know, the main theorems. He wanted us to know the proofs of a lot of things. He was also expecting us to just kind of talk about it as opposed to me, I mean, he would ask a specific questions, and we had to answer those specific questions. But he also was telling me as I was preparing for it, that I should just be ready to talk about whatever topic came up. Because If I don't come up with things to talk about, then he's going to ask me that really hard, proof type of questions. Not that proofs are necessarily the worst, but he had asked me to prove really difficult things about the topic.

29 Weverton: So if we were to go back to that day, Like, can you tell me more like describe like this scenario? Like how that happened? Like, maybe just try to be descriptive about it. I'm curious.

30 Kelly: Sure. Yes
31 Weverton: It made me anxious. I wasn't there, I didn't do it. But just to think about like, studying that long to take one exam, in one day, so I am anxious and I want to hear more about this.

32 Kelly: Right. Yeah. Yeah. So I was in the room ahead of time, it was a room a little bit bigger than this one, with chalkboards on three of the four walls. And I was very nervous. I was almost like standing in a corner. And then my advisor and the other Professor walk in my advisor was Dr. Orange. And the other professor was Dr. Heiser. And Dr. Hans, I got there first. And he could tell it was nervous. Because he started asking me like, oh, did you get to go on a run today? Because he knows I like to run? And I was like, No, like, well, maybe after this. He was he was trying to calm me down. So we kind of get started. And I think they could really tell I was nervous, because they started asking me some really simple questions. Like, is the localization of a ufd still a Ufd? And at first, I thought about it totally backwards. Like, the localization of a ring is a ufd. Does that mean the ring is a ufd? And they're like, no. Our question was this, write it down on the board. So You know, we kind of got moving that way. Yeah. And then as the time went on, there was like, a

problem that I got, like really stuck on. And I felt like one of my students in calculus, where I'm giving them a hint when they're stuck on a problem. And inside my head, the hint is telling them the answer. And they just don't, don't see it. And that was me up. They're really giving me these hints that they thought were really helpful. And I was just like, I have no idea, Like, I don't know about this is helping me with. But eventually, we got through that problem. got through all the details there. And they were like, we're going to take a bathroom break. They left for a few minutes, and Dr. Hines and not, my advisor got back in first and he goes, like, How are you feeling? I'm like, bad, this is not going well. And he was just like, Oh, it's okay. It's a lot of pressure up there. I think you're doing great. And then my advisor walks in, he just has this scowl on his face. I was like, Oh, he's he's not happy here. Yeah, the rest of the exam went better than the first half did. It was not good still, but it went better. And then, you know, at the end, they said they passed. And I told my advisor, I'm like, I'm really sorry. I know, I did not do well. And he said, you know, it's all right, I could tell that you knew enough of what was going on, Maybe you should review some of these older topics. And I just said, okay, but inside my head, I'm thinking like, I really studied them a lot. I think I could do well, you know, not standing up at the board. But yeah.

33 Weverton: So can you tell me about one of the classes you took in your PhD, I just want to know very basic about the course you can tell me what was the class? And what was it? Like? How did you prepare for the class? And it can be any class?

34 Kelly: Sure, yes. Um, So one of the first ones that I took with my advisor was 557, abstract algebra one. Except that's kind of a misleading title, because it says abstract algebra one, but it's really about commutative algebra. And so it covered, you know, modules and flat and free modules. And all the way up until see this part one of like a three part course I'm trying to remember. It ended on like directed limits of modules. And that one was similar to all the other courses, they were all like lecture style. No definition theorem, proof solid there. We had a list of suggested textbooks, except really what you wanted to do for that class was just follow the notes. That was one of the professors here who has really good notes. His notes are better than any textbook out there in terms of helping to understand the topic, which was really great. And I mostly studied for that one, just by doing the homework problems. writing out the proofs in full detail, so that I knew I was following what was going on. There weren't any exams in that particular course. Yeah, Are there any others..?

35 Weverton: Did you study by yourself? Or were tou studying with peers?

36 Kelly: Yeah. I always started by myself. And then as I got stuck on problems, then I would go and work with my friends on it, who were also in the course.

37 Weverton: And in the particular course, was there any study group going on Or no?

38 Kelly: not officially [Weverton: Okay] But there was a group of us that would just, whenever we ran into issues, we just kind of show up in each other's offices and talk about it.

39 Weverton: I see. Oh, right. And can you tell me more about your interaction with the professor that was teaching the course?

40 Kelly: Yeah, I personally did not interact with him a lot. At that point, I was probably something that would have been good for me to do. As the courses went on, I would show up to his office hours every so often. But he's not one for a lot of personal interaction. He is more of like, if you ask your questions, He's very helpful at explaining things. Or if you're stuck, he'll sort of let you think about it for a little while. He doesn't like give the solution right away. But Yeah, it's, You have to go to him. And then he's very, very helpful. And it's all about the math.

41 Weverton:

42 Unknown Speaker

43 I see. So back, like, if you could go back, you would look for him more, right? Is that right?

44 Kelly: Yeah, I'll go to his office hours more.

45 Weverton: All right. So can you tell me, can you tell me about a moment that you felt like you did not belong to this program?

46 Kelly: Yeah. Um, I had a lot of those moments. So I think a lot of that came in. is it okay, if I started describe, like, overall, as opposed to like, a particular one moment, or do you prefer a particular [Weverton: a particular one] A particular one, okay. One particular one, where I wasn't sure I belonged was when I was studying for that advanced topics exam. And some of my friends who are older, gave me a mock exam. And again, it went very poorly. Um, but yeah, I just kind of walked out of there. And it was just like, they know this material. And I don't know it as well. And I'm not sure if I care enough to know it as well as they do. And I think part of that comes into play with my interest really being more in the students and educational side than in the algebra side. But I think part of it was also that my performance was not what it should have been there.

47 Weverton: So your performance in the mock exam, right? [Kelly: Yeah. Yeah.] And Why did you feel like you didn't care enough? Maybe you didn't care enough?

48 Kelly: Yeah, um, I knew the amount of time that it would take to know the all of the material as well as I needed to. And I just wasn't sure I was willing to put in that time. Yeah.

49 Weverton: So It's one exam, about materials you'll learn for one and half years, is that right? [Kelly: uhum] I can't imagine that.

50 Kelly: It's very stressful, I was jealous, too, because this exam changes a lot depending on your advisor. So that was what my advisor wanted. Other people did presentations were, you know, half the exam was the presentation and half the exam was questions about what they were presenting on. And so they could prepare materials for it. And I felt confident that if I could, you know, prepare my materials, I would be fine. But just being able to stand up there, I didn't feel prepared.

51 Weverton: You just go without anything, you just go there [Kelly: just go with a piece of charcol. Yeah] So What What are you thinking about doing after your PhD program

52 Kelly: I want to teach in a small school.

53 Weverton: What attracted to that job?

54 Kelly:Uhh, I love the topic. And I really enjoyed teaching, I enjoy interacting with the students. And I love to see them get excited when they understand something. And they learn something new in a math course. And I really liked the small school atmosphere, because I like the idea of getting to know students over time, and having them again and again, instead of having them like once and then they're gone. And you never see them.

55 Weverton: Yeah. So is that is that a common path that people want to teach in small schools after the PhD?

56 Kelly: It's somewhat common here. Yeah.Yeah, I don't think it's common everywhere, necessarily.

57 Weverton: And If you were to describe the typical day of a student you consider strong in the program. Like typical day, what would that look like?

58 Kelly: Yeah. Probably depends on where they're at in the program. So if they're taking classes, I think most of the strong students in the program have set a schedule for themselves, not all of them have, but a lot of them have sort of figured out, you know, what hours they're going to be working in what hours, they won't. So come in at some point in the morning, and they go to their classes, and both that they're taking in that they're teaching, They probably spend a small amount of time on the teaching part, maybe an hour to on planning, lesson or grading. And the rest of their time is on homework or reading over the notes. Again, in order to understand things better, leading up to the homework or an exam. if it's later on, then replace all of that classwork and homework with their research topic.They probably spend some of the day just sort of playing

around with whatever it is they're working with, In particular, and also spends part of the day reading articles related to their topic.

59 Weverton: Nice.

60 Kelly: And, you know, of course, they'll also be like working with some other people in there. It's not like it's all one person.

61 Weverton: And can you tell me about a mathematician, you know, in your department that you admire?

62 Kelly: Yeah. I admire a lot of them. I mean, one of them is my older advisor, Dr. Orange, I definitely admire him a lot. He's very dedicated to the field. But He also is very dedicated to students like he's well known in his research area, but also like I was mentioning earlier, his notes and his lectures are some of the best ones at Frank University. versus some of the other professors who are really good research mathematicians are not so good as instructors, you know, they come in and their lectures are a little disorganized. And sometimes you can't quite tell what they're talking about. Versus His were very sort of methodical. And you could tell he, he knew what he was talking about. And he had planned on it. And He is very available to students. Which is another thing that I really admire.

63 Weverton: And let me back up a little bit. So when you talked about the study groups, was not well structured, that is more like you guys go to each other's office? [Kelly: Yeah.] Was there a particular kind of people you like to like you reach out more than others like? And if so, can you describe how would that look like who were those? But people?

64 Kelly:Yeah,yeah, I mostly reached out to, for that class, in particular, to two people to Rachel and Eddie. They were actually in offices right next to mine. And they also, I think the reason why I was more comfortable reaching out to them was because they would my first year, stop by my office and just chat with me. How are you doing? What classes are you in? How are they going? That sort of thing? Yeah.

65 Weverton: Were there anytime in the program you felt like you didn't have people you could reach out to or no?

66 Kelly: Not really, There were classes where I didn't feel as much like I had people to reach out to, because I didn't know as many students in the class. But even then, there was always at least one person who I knew who I talked to a little bit before, and then I usually go to that person.

67 Weverton: Nice.Alright, so why do you think the average PhD student in math decide to pursue a Ph.D.?

68 Kelly: I think probably the average reason would be that they really love the subject. Yeah, Some people more loves the teaching of the subject. Some people more love the research of the subject. But I think that the common thing would be that they really love it.

69 Weverton: And What about like the student, like his average student, why you think you would pursue it a Ph.D. in math?

70 Kelly: Like an average undergraduate student pursue a PhD [Weverton: Yeah] I still think they have to, in some way, really care about it and really be excited about it. I could see a small portion of people doing it solely for sort of like career and prestige purposes, but I don't think they'll make it through the program, if that's their only motivation.

71 Weverton: Is there any particular reason why you think that they canot make it through the program?

72 Kelly: It's a long time, and it's a lot of work. And If someone's doing this solely for a job without also loving the material, I, probably some people could. But if you're just thinking, you know, if I get a PhD, I'm gonna make more money or get this job, I don't see them making it average program. Well, the average time at Frank University is six to seven years, We're a little bit longer than some other schools, but a lot of schools six years for a PhD in math. Granted, that's masters rolled into people usually don't separate them. A lot of people do just like all one program. If you

go, the more applied route five is more normal. But still, you're five or more.

73 Weverton: So Yeah, this is something that I'm really impressed about the time here, like, I feel like seven years, Does that include a master's degree in those seven years?

74 Kelly: Sort of? Yeah, So Um, so usually people come in without a Masters, some people do come in with one, but most students come in with no masters, After two to three years, though, fulfill the requirements for masters. But You aren't required to fill out the paperwork to get your master's degree. So like, I finished all the coursework to get a Masters after my second year, but I just didn't bother with the paper work because I am going to get the PhD anyway. And that is pretty common here.

75 Weverton: So You don't need that master's degree?

76 Kelly: No.

77 Weverton: Oh, that's so interesting. All right.

78 Kelly: yeah, Different probably from education.

79 Weverton: Yeah. Usually. I mean, at IU they wouldn't accept you without a master's degree.

80 Kelly:That's the same here. yeah.

81 Weverton: All right. So if you're accepting a student to mentor in math, What qualities would that student have?

82 Kelly: Yeah. I would want to know that they are willing to work hard, be dedicated and put in the time to work on the material and learn it. I do want to know their motivation too, I want to make sure that they're really motivated for whatever their whatever their goal is. Probably also want them to be organized. [Weverton: Organized?] Yeah, At least. I mean, I don't know that can be taken different ways. But at the very least, you know, if they told me that they're going to meet with me at this time and place, I want them to show up, yeah!

83 Weverton: is that common that students here are not organized?

84 Kelly: I think most of them are. But I mean, I'm imagining an undergraduate student in this scenario. And, you know, some of them are some of them aren't.

85 Weverton: Yeah. All right. So what are your impressions of the professors in the math department?

86 Kelly: Yeah, Um, I mean, they all care a lot about math. And they all have to be, you know, dedicated to their research, and they all have to have some research accomplishments in order to be at Purdue. And then I'd say there's kind of a divided between them, after that, where some of them are also caring about the instruction and caring about the students. And some of them, it's not that they don't care. It's not like they're, you know, being rude or anything. But they're just so focused on their research. That, you know, their interactions with the grad students kind of, you know, falls to the side.

87 Weverton: I see. It's more like they prioritize their research.
88 Kelly: Right. Yeah, Yeah.

89 Weverton: Interesting, and ah, What do you think we could do to encourage more students to study a Ph.D. in mathematics?

90 Kelly: Yeah. I mean, specifically at Purdue, I think it'd be nice if they could make the average closer to 6 under 7 years. And the way they would do that is they'd have us teach less, because they have us teach a lot at Purdue. And that takes up a lot of time as a bunch of time as opposed to Notre Dame, I know, they students don't teach their first year. And so then their students are typically taking three courses a semester, whereas most of us take two courses a semester, their first year. So that cuts out a bit of time for them. I think the other thing would be to make, I don't know exactly how this should be done. But to find a way to have students more interested in the abstract, upper level courses in undergrad. I remember, I loved those courses, I thought they were great. But some of my friends who, you know, I really enjoyed their math classes up until that point, hit those classes, and had a bit more of like a, Why do I have to do this kind of attitude towards it? They didn't appreciate the rigor and how, like deep and abstract it could get. So if there's a way to make more people interested in that, or to make it more fun for people, I don't know. I think increased interest in those classes would correspond with increased enrollment in grad school.

91 Weverton: All right, and so I think you talked a little bit about it. But I will ask again, just to make sure that you go, Where do you want to go to the same point a different one. So What changes should be made in the PhD program?

92 Kelly: Yeah, One of them would be to cut down on teaching assignments for first and second year students. Yeah, that would allow them to just go through more courses and cut down on some time in the program to be taking more courses in the semester. And then, I would say another thing is, I think there's a good number of students who struggle to figure out a research area, like I know, I was one of those, and they've tried to work on this a little bit Through a seminar that they do called bridge to research. But Even then, that one is, you know, somewhat limited in impact. I think, because sometimes what happens is you get a lot of people from analysis and probability in there. And then if you are more interested in the algebra side of things that you don't get as much of a viewpoint of what's going on. And then also, I think, better mentorship from faculty, they assign an academic advisor to all the incoming students, but those advisors really range widely and how helpful they are. So I know like my one friend, She granted came in with a research topic in mind. And her advisor was going to be working with her on that research topic. So her advisor was very helpful about not take these courses, don't take these ones, here's what we're going to do to sort of move you along. I wasn't sure what research area I wanted. And I came in and my advisor was very kind. But I would show up to his class and say, okay, there's these three courses. I know that since I'm teaching, I only have time for two. What do you think? And he looked at them and go, Well, that's a pretty good course. And that one's pretty good. Good. That's a good one. I think these are all good. And I was Just like, Okay, So my office mates who were older graduate students, they were the ones who really advised me the first few years. Yeah.

93 Weverton: Yeah, that's interesting. So was there any time that you felt like unsupported by faculty, you know, we that would make a time here goes by faster or was there any lack of support from…
94 Kelly: Yeah, I felt a lack of support when I was trying to find a research area, because it's very much on the student. I mean, they have that, you know, bridge to research seminar that I mentioned. But it's somewhat limited in what it gives you there. And then other than that, it is solely student motivated, you have to go talk to the professors read papers. And You know, sometimes you would go talk to a professor about their research, but then find out that they're not

taking students right now. And it's on you to find an advisor. That was hard for me to do. And I think that's hard for Not everyone. But a good number of grad students.

95 Weverton: have you ever talked to anyone who expressed the same feelings towards finding a research topic, and I finding an advisor.

96 Kelly: I know a couple others have. I haven't talked too extensively to people about this. But Yeah, I know, I have one older grad student who was having a rough time because she liked too many areas of math, so she couldn't decide what to do. And there's just sort of a general consensus in the department that finding an advisor is hard. I don't know that people really sit down and talk about that in full detail. But Yeah, that's just sort of a known thing in the department.

97 Weverton: is it like something that passed on by faculty or by other grad students, like, how do people perceive these as being something that is hard?

98 Kelly: the grad students are the ones who say that finding an advisor is hard?

99 Weverton: I see. So What do you think someone give up in obtaining a Ph.D. in mathematics?

100 Kelly: Yeah, I think some of it is the length of time. Yeah, it's a long program, and some people are ready to be done. I think some people just discovered that they're not as interested in it as they thought they would be. Especially too, because in a lot of industry jobs, you don't need a PhD, you just need a masters. And so if people realized that there really weren't interested in like working at an engineering firm, Why stay for the PhD if a Masters will do it?

101 Weverton: all right. Interesting. Let me ask you something back now. Yeah. So these questions can feel very broad and hard to answer. And I'm not quite sure I'm using the right term, because the answer is not leading to what I was thinking.

102 Kelly: Okay. Sure.

103 Weverton: Bu let's try. So I was wondering, what is the earliest significant memory of doing something that involved to use of mathematics? When is your earliest?

104 Kelly: My earliest one was in first or second grade. And our teacher had a, I think it was like an addition problem on the board. And we were all sitting in a group around the board. And she was asking us, you know, like, Can anyone figure out what this is? And I was sitting there and looking at it. And I don't even know what my thought process was. But like, I knew the answer. Like it was coming out of me. I knew what it was after a bunch of other students who were smart kids in the class, you know, couldn't come up with the right thing. And I said it and the teacher goes, that's great. How did you come up with that? And I was like, I don't know. Drew is like, well, something in your brain was working. And yeah

105 Weverton:Nice, and I think that it's common to go through negative experiences. While we are in a program such as mathematics, I mean a PhD mathematics? [Kelly:Yeah]. So How do you overcome negative experiences?

106 Kelly: Yeah, Right. Right. Um, I think part of it is thinking back to my goal I really want to teach undergrads and can't do that with a PhD. So there were there were various points in the program where I started looking into like, oh, what other jobs might be interested if I wanted to leave? And No matter what I looked at, I was like, Yeah, but teaching undergrads looks way better. I'd say that was probably the biggest thing.

107 Weverton: All right. So I have one less activity for you. All right. Very curious about. So If I asked you to draw, you don’t need to be good at drawing, or he said, Oh, I'm not changing your drawing skills. Better to draw an ideal mathematician? What would that look like?

108 Kelly: This feels like a loaded question.I think I'm done?

109 Weverton: Nice. can you describe for me what you did?

110 Kelly: Yeah, I chose blue, cuz I didn't want to make it like a person of any color race. I also didn't give them any clothes for the same reason because I don't want to make any those kinds of assumptions about you know, gender or anything like that. They have books with them. Because I think that the I deal mathematician I picture is someone who's at least had like some learning. They've moved beyond sort of like the elementary parts of mathematics, and they're into some of the deeper stuff. They're happy about what they're doing. Draw heart because they love it and are feeling joyful about it. But I also didn't want the books to make it seem like they're, you know, sitting in a room inside all the time. So there's a window and you know, they also sort of have an eye on the outside world. They're not just you know, stuck up in their own little world.

111 Weverton: Nice. All right. Great. That's all for today. [some more conversation that doesn't matter]