MA 16010 Extra Credit 2

For sections: Sections 024 and 017
Instructor: Patrick DeBonis
Due: Monday 3/7

Read the following passage from the book *Mathematics for Human Flourishing* by Francis Su, and answer the following questions in 100-200 words total.

1. Give two examples of how Linda Furuto sees a connection between her life and culture and math.
2. Think about your culture, where you grew up, what you are studying in college, your life in general. What connections do you see between any of these and math? Maybe you don't find any connections. If that's the case explain why.

Linda Furuto is a mathematics explorer, and she helps others see themselves as explorers too. She grew up on the North Shore of Oʻahu in Hawaiʻi, spearfishing, diving, swimming, and surfing. Although she struggled with math as a child because she didn't see its relevance, she can now see math embedded everywhere around her, from the dynamics of the oceans to the optimization involved in maximizing her time underwater. Now, as a math education professor at the University of Hawaiʻi at Mānoa, Linda helps students see how mathematics is connected to their cultural histories. She shows students how seeing the world as a math explorer can inform their understanding of marine biology and conservation—the linear functions modeling how coral reefs are being cleared of invasive algae, the matrices describing ocean debris collection, and the quadratic equations involved in sustaining limited island resources. She takes students sailing on *Hōkūleʻa* (Star of gladness), a double-hulled canoe of the Polynesian Voyaging Society, on which they learn about the traditional practice of wayfinding among the Indigenous peoples of Hawaiʻi and the Pacific.[11] Such techniques rely solely on observing clues from nature and the heavens to navigate without instruments. Over the past four decades, *Hōkūleʻa* has sailed more than 160,000 nautical miles, including the Mālama Honua Worldwide Voyage (begun in 2013), dispelling any doubts about the reliability of this ancient practice.[12] Linda's role is apprentice navigator and education specialist on land and sea. She helps students explore the trigonometry and calculus em-

bedded in knowing wind dynamics and sail mechanics, and why these are significant beyond memorizing formulas:

> I believe it is important that students know what is written in our textbooks, because they contain important information. However, equally critical is that our students understand and realize that their ancestors sailed thousands of miles across the Pacific Ocean without any kind of modern navigational tool—by the sun, the moon, the stars, the winds, the tides, migratory bird patterns, and more. They traversed oceanic highways in the past, and our students are capable of doing the same things inside and outside of our classrooms today.[13]

Indeed, the wayfinders were mathematical explorers of their society, using attentive study, logical reasoning, and spatial intuition to solve the problems they encountered in their cultural moment. Mathematical explorers have been part of every civilization in every corner of the earth, and Linda sees the importance of drawing the straight line from the mathematical explorers in her students' cultural history to the mathematical identity she'd like them to embrace.