Maths Circle Explorations: Session 3

November 26, 2021

1. A new test has been developed for a rare disease. The test is 99% accurate. This means that 99 out of 100 times, the test correctly identifies whether or not a person has the disease. Studies have estimated that, at any given time, this disease affects about 1 in 10000 people in the general population. Uma decides to get tested for the disease.

   (a) Suppose that the test result is positive (i.e., the test says that Uma has the disease). What is the probability that Uma actually has the disease? If the test result is negative, then what is the probability that Uma really does not have the disease?

   (b) How do your answers change if the disease is less rare, and is found in 1% of the general population?