

Name: _____

MATH 100

Fall 2023

HW 11: Due 12/06

"The 50-50-90 rule: anytime you have a 50-50 chance of getting something right, there's a 90% probability you'll get it wrong."

–Andy Rooney

Problem 1. (10pt) A community college is trying to decide how to advertise to prospective students at a local high school. The college decides to investigate students' interest in various STEM disciplines. The chart below summarizes the number of students that indicated they were interest in a particular STEM discipline, broken down by HS year.

| | Math | Physics | Chemistry | Biology | Exercise Science | Total |
|--------|------|---------|-----------|---------|------------------|-------|
| Junior | 2 | 5 | 8 | 14 | 16 | 45 |
| Senior | 3 | 4 | 9 | 13 | 11 | 40 |
| Total | 5 | 9 | 17 | 27 | 27 | 85 |

- (a) Find the percentage of students that are interested in only Exercise Science.
- (b) Find the percentage of students that Seniors interested in Physics.
- (c) Find the percentage of students interest in Math or that were Juniors.
- (d) Find the percentage of those interested in Exercise Science that were Seniors.
- (e) Are the 'events' of being a Senior and interested in Biology independent? Explain.

Problem 2. (10pt) There are two main production lines at a manufacturing warehouse. The main line handles 60% of the production at the warehouse, while the secondary handles the rest. The first has a defect rate of 4% while the second has a defect rate of 2%.

- (a) Find the probability that the warehouse produces a defective product.
- (b) Find the probability that a product from the warehouse was made from the secondary line or defective.
- (c) Find the probability that a product from the warehouse was made from the main line and was not defective.
- (d) Find the probability that if a product was defective that it was produced from the main line.
- (e) Are the events of a product being made on the secondary line and the event of a product being defective disjoint? Explain.