Name: _____

MATH 107
Winter 2022
HW 15: Due 01/18

"In practical life we are compelled to follow what is most probable; in speculative thought we are compelled to follow truth."
–Baruch Spinoza

Problem 1. (10pt) Let A and B be events in a probability space with...

$$P(A) = 0.45$$
$$P(B) = 0.23$$
$$P(A \text{ and } B) = 0.16$$

(a) Find $P(A \text{ or } B)$.

(b) Are A and B disjoint? Explain.

(c) Are A and B independent? Explain.

Problem 2. (10pt) Let A and B be independent events in a probability space with $P(A) = 0.80$ and $P(B) = 0.55$.

(a) Compute $P(A \text{ and } B)$.

(b) Compute $P(A \text{ or } B)$.

(c) Are A and B disjoint? Explain.

Problem 3. (10pt) Let A and B be events in a probability space with...

$$P(A) = 0.20$$
$$P(A \text{ and } B) = 0.15$$
$$P(A \mid B) = 0.80$$

(a) Find $P(B \mid A)$.

(b) Find $P(B)$.

Problem 4. (10pt) Give an example of two events which are not disjoint and explain why they are not disjoint. Give an example of two events which are not independent and explain why they are not independent.

Problem 5. (10pt) Watch Stand-Up Math's "How lucky is too lucky?: The Minecraft Speedrunning Dream Controversy Explained" on YouTube. Being as detailed as possible, comment on what you learned and how it connects to the course material.