Name:

MATH 100

Fall 2022

HW 15: Due 11/07

"Life is a school of probability."

-Walter Bagehot

**Problem 1.** (10pt) Researchers surveyed 320 people on which superpower from comics they found most interesting/best. A table of their findings are found below.

	Child	Adult	Total	
Flight	30	36	66	
Mind Reading	15	60	75	
Super Strength	40	14	54	
Total	85	110	195	

- (a) Find the probability that a person chose flight as the best superpower.
- (b) Find the probability that a person surveyed was a child.
- (c) Find the probability that a person was a child and chose super strength as the most interesting super power.
- (d) Find the probability that a person chose mind reading or was an adult.
- (e) Find the probability that a person that chose mind reading was an adult.

**Problem 2.** (10pt) Consider the breakdown of students majors at a college by gender.

	School of Business	School of Education	Arts & Social Sciences	STEM
Male	80	85	75	92
Female	75	80	90	94
Unspecified	8	15	22	1

- (a) Find the probability that a randomly selected person from this school was in education.
- (b) Find the probability that a randomly selected person from this school was male.
- (c) Find the probability that a randomly selected person from this school was a female and in the School of Business.
- (d) Find the probability that a randomly selected person from this school was in STEM or had unspecified gender.
- (e) Find the probability that a person was in the school of Arts & Social Sciences given that their gender was unspecified.

**Problem 3.** (10pt) Is it always true that for events A and B,  $P(A \text{ and } B) = P(A) \cdot P(B)$ ? Explain using an original example.