Elementary Statistics (STA 1020)

Hand-in HW #4 Name:

Directions: Answer each question completely. While collaboration with fellow students is encouraged, simply copying answers is not acceptable and is grounds for earning a zero on the assignment as well as being reported for cheating. Please show all work where appropriate and as modeled in class/in the videos. Make sure to use proper units where required and as modeled in class. You may use a calculator where needed but remember to still show your work.

1. [5] The data in the chart was taken from the Wayne State University Institutional Research and Data Analytics website (https://irda.wayne.edu/coursedashboard) showing credit hours offered across course modalities and class levels for the Winter 2025 term. Answer the questions that follow.

	Hybrid	Individually Arranged Sections	Online - No Scheduled Meetings	Online - Scheduled Meetings	Traditional - Face to Face	Total
LD - Lower Division	8,125.0	278.0	32,493.0	2,895.0	62,951.0	106,742.0
UD - Upper Division	5,303.0	3,630.0	19,409.0	4,052.0	46,762.0	79,156.0
PR - Graduate Professional Level	454.0	16,368.5	738.0	76.0	25,995.0	43,631.5
MC - Masters or Post-bachelors Cert	2,924.0	4,784.5	14,265.0	2,686.0	13,016.0	37,675.5
DR - Doctorate or Post-masters Cert	147.0	3,375.5	267.0	261.0	3,543.0	7,593.5
Total	**16,953.0**	**28,436.5**	**67,172.0**	**9,970.0**	**152,267.0**	**274,798.5**

   a. [2] What is the probability that a randomly selected credit hour is a hybrid Masters course?

   b. [2] What is the probability that a randomly selected course is an Upper Division level class given that it is runs as a traditional face-to-face course?

   c. [1] Which class modality do you prefer? Why?

2. [4] Two cards are selected with replacement from a standard 52-card deck.
   a. [2] What is the probability that the first card is an ace and the second card is a heart?

   b. [2] What is the probability that the first card is a king or the second card is a club?

3. [4] A local soccer team has 8 starting players: 3 defenders and 5 forwards. For a community outreach event, 2 players are randomly chosen to speak at a school. The selection is done without replacement.
    a. [2] What is the probability that both players chosen are defenders?

    b. [2] What is the probability that at least one of the players is a forward?

4. [7] Data collected from the US Census Bureau gives the discrete distribution of the number of vehicles in American households (https:/data.census.gov/table/ACSDP5Y2023.DP04).

No vehicles available	8.3%
1 vehicle available	32.9%
2 vehicles available	36.8%
3 or more vehicles available	22.0%

    a. [2] Is this a valid probability distribution? Explain.

    b. [3] Find the expected value of this probability model and interpret.

    c. [2] Let X be the number of vehicles. Find the value of $P(X \geq 2)$.