Probability Assignment

Choose any 10 of the 15 Questions to complete. Each question will be marked out of 3, but only your first 10 will be marked, so choose carefully.

Complete all the work on a separate sheet of paper, showing all your steps.

Problem

1. A group of students are holding a charity carnival to support a local animal shelter. The students have created a dice game that they call Zing and a card game that they call Bloop. The odds against winning Zing are 3 : 2, and the odds against winning Bloop are 3 : 7. Which game should Lena play? Show your work.

2. Greg, Bogdan, Dave, and Li are competing with eight other boys to be on their school's cross-country team. All the boys have an equal chance of winning the trial race. Determine the probability that Greg, Bogdan, Dave, and Li will place first, second, third, and fourth in any order. Show your work.

3. There are 9 players on a baseball team, all with roughly equal athletic ability. The coach has decided to choose the players who will play the three outfield positions (left field, centre field, and right field) randomly. Tara and Katherine are on the team. Determine the odds in favour of Tara and Katherine being chosen to play in the outfield. Show your work.

4. A survey reported that 42% of households have one or more dogs, 28% have one or more cats, and 39% have neither dogs nor cats. Suppose that a household is selected at random. Determine the probability that there are cats but no dogs in the household. Show your work.

5. Aisha plays the balloon pop game at a carnival. There are 50 balloons, with the name of a prize inside each balloon. The prizes are 10 stuffed bears, 6 toy trucks, 21 decks of cards, 9 yo-yos, and 4 giant stuffed dogs. Aisha pops a balloon with a dart. Determine the odds in favour of her winning either a stuffed dog or a stuffed bear. Show your work.

6. On Thursday, the weather forecaster says that there is a 40% chance of rain on Friday and a 70% chance of rain on Saturday. The forecaster also says that there is a 20% chance of rain on both Friday and Saturday. Determine the probability that there will be rain on Friday or on Saturday. Show your work.

7. Sun asks Reese to choose a number between 1 and 35 and then say one fact about the number. Reese says that the number he chose is a multiple of 4. Determine the probability that the number is also a multiple of 3, using a Venn diagram. Show your work.

8. Debra is the coach of a junior ultimate team. Based on the team's record, it has a 70% chance of winning on calm days and a 50% chance of winning on windy days. Tomorrow, there is a 30% chance of high winds. There are no ties in ultimate. What is the probability that Debra's team will win tomorrow? Show your work.

9. Each day, Julia's math teacher gives the class a warm-up question. It is a true-false question 20% of the time and a multiple-choice question 80% of the time. Julia gets 70% of the true-false questions correct, and 90% of the multiple-choice questions correct. Julia answers today's question correctly. What is the probability that it was a multiple-choice question? Show your work.

10. Trista remembers to set her alarm clock 82% of the time. When she does remember to set her alarm clock, the probability that she will be late for school is 0.30. When she does not remember to set it, the probability that she will be late for school is 0.60. Trista was late today. What is the probability that she remembered to set her alarm clock? Show your work.

11. The probability that a plane will leave Winnipeg on time is 0.80. The probability that a plane will leave Winnipeg on time and arrive in Calgary on time is 0.42. Determine the probability that a plane will arrive in Calgary on time, given that it left Winnipeg on time. Show your work.

12. Stacey goes to the gym five days a week. Each day, she does a cardio workout using either a treadmill, a stepper, an elliptical walker, or a stationary bike. She follows this with a strength workout using either free weights or the weight machines. Stacey randomly chooses which cardio workout and which strength workout to do each day. Determine the probability that Stacey will use a treadmill and the free weights the next day. Show your work.

13. A paper bag contains a mixture of three types of treats: 12 granola bars, 10 fruit bars, and 8 cheese strips. Suppose that you play a game in which a treat is randomly taken from the bag and replaced, and then a second treat is drawn from the bag. You are allowed to keep the second treat only if it was the same type as the treat that was drawn the first time. Determine the probability that you will be able to keep a cheese strip. Show your work.

14. Anna's school is holding a chocolate bar sale. For every case of chocolate bars sold, the seller receives a ticket for a prize draw. Anna has sold eight cases, so she has eight tickets for the draw. At the time of the draw, 130 tickets have been entered. There are two prizes, and the ticket that is drawn for the first prize is returned so it can be drawn for the second prize. Determine the probability that Anna will win no prizes. Show your work.

15. Elin estimates that her probability of passing French is 0.6 and her probability of passing chemistry is 0.8. Determine the probability that Elin will pass both French and chemistry. Show your work