Questionnaire

1. What is your name?

2. What are your pronouns?

3. What is/are your major(s)/minor(s)? (If not yet declared, what are you leaning towards?)

4. Tell me something interesting about yourself so that I can get to know you better.

5. What is your favorite number between 1 and 100? (integers only)

6. What is your birthday? (just month and day, not year)

7. What are the last 3 digits of your cellphone number? (If you don't have a number, or prefer not to share, choose 3 digits at random)

For each of questions 5-7, assess how likely you think it is that:

- someone else reported the same answer as you

- at least two people reported the same answer (where you are not necessarily one of the "at least two")

Use the following scale to describe this likelihood and fill-out the table below:

1. Almost never: you can't imagine this ever happening.

2. Very unlikely: you are confident that this won't happen, but it's possible it might.

3. Unlikely: this probably won't happen, but you wouldn't be surprised if it did.

4. Even: this is about as likely to happen as not.

5. Likely: this probably will happen, but you wouldn't be surprised if it didn't.

6. Very likely: you're confidant that this will happen, but it's possible it might not.

7. Almost certainly: you cannot imagine this not happening.

	Same as you	At least two same
Question 5		
Question 6		
Question 7		

Calculus review

Calculus is essential in probability and statistics. The following questions are meant to be a self-assessment or review. I suggest first trying the problems without looking at additional resources. If you can do most without too much trouble, then you have the perfect amount of mathematical background for this course. If you find some of the problems challenging, I encourage you to look back to your notes from previous courses or review the material with friends.

1. Simplify $\frac{2}{7} + \frac{1}{3}$.

2. Simplify $-2\log(\frac{1}{4}) - \log(6)$.

3. Simplify $e^{2a}e^{3b} + 4$.

4. Find the derivative of $f(x) = (x^2 - 1)/(x - 1)$.

5. Simplify $\sum_{i=1}^{3} 2i$.

6. Find the local maximum of the function $f(x) = x^3 - 6x^2 + 9x + 15$. Be sure to verify it is a maximum.

7. Evaluate the following integral: $\int_0^1 \frac{x}{1+x^2} dx$.

8. Find the first four terms of the Taylor series expansion for $f(x) = \log(1 + x)$ at $x = 0$.

Discussion Questions

1. What is Mathematics?

2. What is Statistics? What is a statistic?

3. What does it mean to say a real-world event has a particular probability of occurring? (For example, what does 25% mean in the claim "There is a 25% chance of rain tomorrow"?)

   (a) Does your answer change if you are describing an uncertain phenomenon that can't be repeated? (For example, in the statement "Candidate A has a 25% chance of winning the 2024 election.")

   (b) Does your answer change if the phenomenon has a cost and reward? (For example, suppose a casino game costs $1 to play and the operator states it has a 25% chance of awarding $4.)

4. Suppose someone claims that an event has a particular probability. How could we verify or falsify this claim?

5. What is the benefit of quantifying uncertainty? What are some negative consequences?