Class 2, Week 9. Teams of 3. Roll of the die determines which team starts and whose team’s turn it is. Preparation time: 20 mins. Max 3 questions per turn.

**Mechanics of the game:** Answering team is selected at random. Answering team must choose a question to answer. Questions are in random order. Correct answer awards team another question. Points for correct answer. Team with the most points wins.

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| **1.** Chevalier de Méré posed a famous question to Pascal and de Fermat. The attempt to answer the question contributed to the “discovery” of modern probability theory. What was the question? (61, 63)  How should two players in a game of balla share the stakes when they leave the game uncompleted | **2.** What concern about information did Jacob Bernoulli (17th C) raise for the first time in regard to the work of calculating future outcomes or probabilities? (117, 2nd & 3rd para.) | **3.** Who were two precursors (forerunners) to Pascal in thinking out possible outcomes to existing circumstances using geometric algebra? What lands were they from? (64, top) | **4.** What famous sceptical statement did the philosopher and mathematician Liebniz (18th C) make about making inferences from sample data? In what approximate year did he make the statement? (118, paras. 2 & 3) | **5.** Jacob Bernoulli’s “jar of pebbles” experiment was a “first” in respect of the measurement and definition of what? (124, last full para.)  In respect of the measurement and definition of ***uncertainty*** | **6.** What is the name given to the statistical tool developed by Abraham De Moivre in the 18th C for determining the distribution of chances or observations around an average (a mean)? (127, 3rd full para.)  De Moivre’s distribution, a normal curve, or a bell curve |
| **7.** What are the probability questions posed by “the problem of the points”? (p. 63)  How much greater are the leading player’s chances?  How small are the lagging player’s chances?  How do these riddles ultimately translate in to the science of forecasting? | **8.** According to Bernstein (Rd 3), the various contributions to probability theory and calculation before 1800 amount to advances in doing what? (133, last para.)  To take on added momentum as the new century approached, and the Victorian era would provide further impulse | **9.** The Bayesian system for calculating probabilities is notable for making possible the inclusion of what kind of information in probability calculation? (p. 132) | **10**. Galileo died in 1642, one year before Pascal was born. What links Galileo and Pascal, according to Bernstein? (p. 57) | **11.** With respect to which type of “true value” did Jacob Bernoulli demonstrate that a given number`s probable closeness could be calculated? (p. 124, last full para.) | **12.** What was the name of the “Problem” on which Pascal and de Fermat worked and which is seen to have led to the development of a theory and method for calculating likely outcomes? (61, 63) |
| **13.** In the Bayesian system, what probabilities can be subject to revision on the basis of new information? (p. 132) | **14**. The achievements in probability calculation attributed to Bernoulli, De Moivre and Bayes are seen as a significant contribution to the measurement of what? (p. 133, 3rd full para.) | **15**. What is the name of the reasoning *process* developed in the work *La Logique* (*The Logic*) published by the Port-Royal group in 1662 (of which Pascal was an associate)? (p. 70) | **16.** To what problem of forecasting or prediction, based on sample data, did Jacob Bernoulli make a significant contribution? (121) | **17**. What famous mathematical tool did Blaise Pascal develop in 1654 for determining possible outcomes of particular circumstances? (64-65) | **18**. Which 17th C work of philosophical thought is credited as being the first work in which probability is measured? (70-71)? |
| **19**. With respect to which two modern techniques of dealing with risk are Pascal and de Fermat’s mid-17th century advances in calculating probabilities significant? (71) | **20**. What theory is believed to have been initiated by Pascal’s consideration of the question of whether or not to believe in the existence of God? (69) | **21**. **Bonus (double or nothing)**: Bernstein’s account of 18th-century developments in probability leaves out the contributions of the philosopher who raised doubts about induction or what we can know about possible future outcomes and occurrences based on past events and occurrences. **Who was that philosopher?** | | **22**. What philosophical idea did Bayes contribute to the question of what can be known about probable future outcomes? (p. 133) | **23.** According to Bernstein, what did the Enlightenment identify as the highest form of human activity? (p. 133) |