Q1. What is a probability distribution, exactly? If the values are meant to be random, how can you predict them at all?

A probability distribution is **a statistical function that describes all the possible values and probabilities for a random variable within a given range**.

Q2. Is there a distinction between true random numbers and pseudo-random numbers, if there is one? Why are the latter considered “good enough”?

The difference between true random number generators(TRNGs) and pseudo-random number generators(PRNGs) is that **TRNGs use an unpredictable physical means to generate numbers (like atmospheric noise), and PRNGs use mathematical algorithms (completely computer-generated)**

Q3. What are the two main factors that influence the behaviour of a "normal" probability distribution?

Mean and std deviation

Q4. Provide a real-life example of a normal distribution.

Rolling a dice

Q5. In the short term, how can you expect a probability distribution to behave? What do you think will happen as the number of trials grows?

Since the fractional width decreases with increasing N, **the number of outcomes for which there is an appreciable probability becomes a smaller and smaller fraction of all possible outcomes** as the number of trials increases.

Q6. What kind of object can be shuffled by using random.shuffle?

Strings and tuples are immutable, so random. shuffle() that modifies the original object raises an error TypeError . To shuffle **strings or tuples**, use random

Q7. Describe the math package's general categories of functions.

One-One Function Many-One Function Onto Function One-One and Onto Function Into Function Constant Function

Q8. What is the relationship between exponentiation and logarithms?

**Logarithmic functions are the inverses of exponential functions**

Q9. What are the three logarithmic functions that Python supports?

**log2(x)** **log(x, Base)** **log10(x)** **log1p(x)**