The Algebra Symposium: Extinction

1. It has been found that the probability of extinction for a given vertebrate species over a period of five millions years is 0.1.

   a) What is the probability of extinction for that species over a period of 50 million years after its inception in the animal kingdom? What is the relationship with coin tossing?

   b) What is the probability that the species will ever become extinct? What is the relationship with geometric series?

2. Political prisoners Matthew, Mark, and Luke are told that two of the three are to be executed. Matthew asks the jailer to reveal the name of one of the other two prisoners that is going to be for sure executed. The jailer names Mark. Matthew is elated because his probabilities of execution have decreased. Why? What if the jailer gave the name Mark at random?