Probability (Repeated Events)

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1. The probability of Alex drinking coffee on any given day is 8/10. Out of 30 days in a month, how many of those days can we expect him to drink coffee?

2. There are 15 different books on a shelf. Four of the books were written by Herman Hesse, seven by J.K. Rowling, two by Donna Tartt, and two by Gabriel Garcia Marquez. Every time I pick a book off of a shelf, I put it back immediately. If I do this 5 times, how many of those books are expected to be written by J.K. Rowling?

3. A rectangle is divided into 3 parts via vertical lines. The left part takes up 3/10 of its area. The remaining sections (center and right) are split into two equal regions of equal area. If you throw a dart blindly at this rectangle 12 times, and the dart always hits some place on the rectangle, for how many of those times can you expect the dart to hit the center section?

4. A animal cookie box has 5 elephant cookies, 4 tiger cookies, 3 giraffe cookies, and 8 monkey cookies. Each time you pick a cookie out of the box, you put it back. After doing this 13 times, how many times can you expect to have picked out a cookie that is **not** shaped like a giraffe?

5. For two concentric (*look it up if you don't know this word!* circles, the outer one has a radius of 5 m, and the inner has a radius of 3m.

   (a) What is the probability of hitting the region **between** the outer circle and the inner circle with a randomly thrown dart, if the dart always hits one of the circles?

   (b) If we repeat the above experiment 7 times, for how many times can we expect the dart to hit some location within the inner circle?