 1) History would suggest that 2% of professional baseball players use PED’s (Performance Enhancing Drugs). A new test will catch a PED user 95% of the time. However, the test will also give a false positive 5% of the time.

a) Draw a tree diagram of the possible outcomes of a drug test (Using/Not Using and +/-), and then calculate the probabilities for the following cases (as a decimal, and as a fraction out of **10,000**).

Tree Diagram:

|  |  |  |  |
| --- | --- | --- | --- |
| Outcome | Probability Calculation (Decimals) | Probability (%) | Probability (out of 10,000) |
| Using and + |  |  |  |
| Not Using and + |  |  |  |
| Totals |  |  |  |

b) Fill in the following table that calculates the probability that a player would test positive.

c) What is the probability that a player who tested positive for PEDs is actually taking them?

BONUS) The Dragons are taking on the Puppies in a 4 game baseball exhibition series where **they play all 4 games no matter what!**

To keep things simple… in every game, they have a 50% chance of winning, and a 50% chance of losing.

Mr. Smith has listed all of the outcomes where they win the series (3 or 4 wins). Find the probability of each outcome.

|  |  |  |
| --- | --- | --- |
| Outcome | Probability Calculation (Decimals) | Probability (%) |
| WWWW |  |  |
| WLWW |  |  |
| WWLW |  |  |
| WWWL |  |  |
| LWWW |  |  |
| Totals |  |  |

Conclusion: What is the probability of the Dragons winning this exhibition series?