

Name _____

Student Number _____

STA256H5F Quiz 2A

1. (2 marks) An experiment consists of tossing 2 coins and observing the face of each coin. Let $\mathcal{S} = \{HH, HT, TH, TT\}$, $A = \{HH, HT\}$, $B = \{HH, TT\}$. Are A and B independant?

Yes A and B are independant

2. (2 marks) Are A and B mutually exclusive?

No since $A \cap B = \{HH\}$

3. (3 marks) *True or False* Let $A, B \subseteq \mathcal{S}$. If $P(AB)=0$, with $P(A), P(B)>0$ are A and B independant? Explain?

Not independant, since $P(A)>0$, but $P(A|B) = P(AB) / P(B) = 0$. So $P(A) \neq P(A|B)$

4. (3 marks) You are buying food for two friends at a local restaurant where they sell hotdogs with 2 possible toppings and hamburgers with 3 possible toppings. Your friends don't care what you order them, so you pick an item for each of them at random, with a random selection of one or more topping(s). What is the probability you order both your friends the same item with the same topping(s)?

$$\frac{1}{\binom{3}{1} + \binom{3}{2} + \binom{3}{3} + \binom{2}{1} + \binom{2}{2}} = 1/10$$