

Name _____

Student Number _____

STA256H5F Quiz 1B

1. (1 marks) An experiment consists of flipping 2 coins. List the sample space of the experiment

$S = \{HH, HT, TH, TT\}$

2. (3 marks) Describe two events in the sample space called A and B, such that $P(A \cap B) > 0$ with $P(A), P(B) > 0$. Please write each set using the sample points as you denoted them in question 1.

$A = \{HH, HT, TH\}, B = \{HH\}$

3. (2 marks) *True or False* Given events $A, B \subseteq \Omega$, with $P(A) + P(B) > 1 \Rightarrow P(AB) > 0$

True

4. (4 marks) De Morgan thinks he came up with a new law. He thinks that, given events $A, B \subseteq \Omega$ $A \cap (A \cap B) = (A \cap \bar{B})$. He can't prove it himself, can you prove it for him?

$$A \cap (A \cap B) = A \cap (\bar{A} \cup \bar{B}) = (A \cap \bar{A}) \cup (A \cap \bar{B}) = (A \cap \bar{B})$$