

Name \_\_\_\_\_

Student Number \_\_\_\_\_

## STA256H5F Quiz 3A

An experiment consists of rolling 1 die and observing the side of the die. Let  $\mathcal{S} = \{1, 2, 3, 4, 5, 6\}$ , Define the random variable  $X$  such that:

$$X = \begin{cases} 1 & \text{if dice roll is even} \\ 2 & \text{if dice roll is odd} \end{cases}$$

1. (2 marks) State the PDF of  $X$

$$P(X=1) = P(X=2) = 1/2$$

2. (2 marks) Find  $P(\overline{(X=1)} \cap \overline{(X=2)})$ ?

$$0$$

3. (3 marks) Define  $Y$  using the same  $\mathcal{S}$  such that:

$$Y = \begin{cases} 1 & \text{if dice roll is odd} \\ 2 & \text{if dice roll is even} \end{cases}$$

Find  $E(2 + 3Y)$

$$2+(3)(1.5) = 7.5$$

4. (3 marks) Are the events  $X=1$  and  $Y=2$  independent? Explain.

Yes,  $P(X=1|Y=2) = 1$  but  $P(X=1) = 1/2$