

Name: \_\_\_\_\_

Entry number: \_\_\_\_\_

There are 2 questions for a total of 10 points.

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1. Answer the following questions.

- (a) (1 point) State true or false (no reasons required): The probability of having an empty bin when throwing  $k$  distinguishable balls randomly into  $n$  distinguishable bins is the same as the probability of having an empty bin when throwing  $k$  indistinguishable balls randomly into  $n$  distinguishable bins.

(a) \_\_\_\_\_

- (b) (4 points) Suppose you flip a biased coin that turns heads with probability  $p$ . What is the probability that you get even number of heads in  $n$  coin tosses. You have to give a concise expression. Show your working in the space below.

(b) \_\_\_\_\_

2. (5 points) A fair coin is tossed repeatedly until two consecutive heads are tossed. Find the probability that the coin was tossed 12 times. Show calculations in the space below.

2. \_\_\_\_\_