

ECE 131A HW 3

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Problem 1

Let C_{ij} be the event that the i th person grabs the j th person's coat, then we have that in order for all of them to have grabbed the wrong coat we could have two possible sequences, $C_{13}C_{21}C_{32}$ or $C_{12}C_{23}C_{31}$, both of these cases can happen with probability $\frac{1}{6}$ therefore the probability that everyone grabs the

wrong coat is $\boxed{\frac{1}{3}}$

Problem 2

(a)

$$\boxed{\frac{1}{1000}}$$

(b)

Since 1003 is not in the range of pages then the probability

$$P(X = 1003) = \boxed{0}$$

(c)

$$\boxed{\frac{1}{1000}}$$

(d)

There are 123 possible pages therefore

$$P(X \leq 122) = \boxed{\frac{123}{1000}}$$

(e)

$$P(12 \leq X \leq 17) = \boxed{\frac{6}{1000}}$$

Problem 3

(a)

$$P(X = j) = \left(\frac{4}{5}\right)^{j-1} \frac{1}{5}$$

(b)

$$P(X = j) = \boxed{\frac{1}{5}, j = 1, 2, 3, 4, 5}$$