Question 1.3.3

Six new employees, two of whom are married to each other, are to be assigned six desks that are lined up in a row. If the assignment of employees to desks is made randomly, what is the probability that the married couple will have nonadjacent desks?

Solution: Let X be a Random variable such that

$$X = \begin{cases} 1 & \text{sitting adjacent} \\ 0 & \text{not sitting adjacent} \end{cases} \tag{1}$$

Total posiible seating arrangement = 6!

$$p_X(1) = \frac{5! \times 2}{6!} \tag{2}$$

$$= \frac{1}{3} \tag{3}$$

$$p_X(0) = 1 - p_X(1) \tag{4}$$

$$= \frac{2}{3} \tag{5}$$