Math 323 Homework # 2

P84. 2.25.Seven applicants have applied for two jobs. How many ways can the jobs be filled if
a. the first person chosen receives a higher salary than the second?
b. there are no differences between the jobs?
Solution: a.

$$P_2^7 = 7 \times 6 = 42.$$

b.

$$\binom{7}{2} = \frac{7 \times 6}{1 \times 2} = 21.$$

P84. 2.31. For a certain style of new automobile, the colors blue, white black, and green are in equal demand. Three successive orders are placed for automobiles of this style. Find the probability that
a. one blue, one white, and one green are ordered.
b. two blues are ordered.
c. at least one black is ordered.
d. exactly two of the orders are for the same color.
Solution: a. Total is $4^3 = 64$. In event, $3 \times 2 \times 1 = 6$.

$$p = \frac{6}{64} = \frac{3}{32}.$$

b. Locations of blues: $\binom{3}{2} = 3$, color of the other order $\binom{3}{1} = 3$.

$$p = \frac{3 \times 3}{64} = \frac{9}{64}.$$

c.

$$\begin{aligned} p &= 1 - P(no\ \ black) \\ &= 1 - \frac{3^3}{4^3} = \frac{64 - 27}{64} = \frac{37}{64}. \end{aligned}$$

d. Use part b, we get

$$p = 4 \times \frac{9}{64} = \frac{9}{16}.$$