

STAT451 HW3

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2.25 A certain shoe comes in 5 different styles with each style available in 4 distinct colors. If the store wishes to display pairs of these shoes showing all of its various styles and colors, how many different pairs would the store have on display?

Well there are 20 different shoe designs. If each pair is to match, then there would be 20 pairs on display. However, the pairs don't need to match in which case you can use a different shoe for the left and right. You would only need to display 10 pairs, still showing all 20 designs.

$$10$$

2.28 A drug for the relief of asthma can be purchased from 5 different manufacturers in liquid, tablet, or capsule form, all of which come in regular and extra strength. How many different ways can a doctor prescribe the drug for a patient suffering from asthma?

$$5 \times 3 \times 2 = 30$$

2.32

- a. **How many distinct permutations can be made from the letters of the word *columns*?**

$$7! = 5040$$

- b. **How many of these permutations start with the letter *m*?**

Simply place the m in the first position, now 6-letter permutation.

$$6! = 720$$

2.34

- a. **In how many ways can 6 people be lined up to get on a bus?**

$$6! = 720$$

- b. **If 3 specific persons, among 6, insist on following each other, how many ways are possible?**

Now we just group those 3 together as one person, leaving 3 others for a total of 4.

$$4! = 24$$

- c. **If 2 specific persons, among 6, refuse to follow each other, how many ways are possible?**

There are 30 ways to position 2 of the six people, and the following would be positions where one is following the other:

$$\{1, 2\}, \{2, 3\}, \{3, 4\}, \{4, 5\}, \{5, 6\}$$

So there are 25 ways to position the 2 specific persons that refuse to follow each other. There are 4 remaining people, so:

$$25 \times 4! = 600$$