21) Combinatorics

First half problems (5.2-5.4)

21.1 165
21.2 720
21.3 40,960,000
21.4 259,459,200
21.5 1,481,760
21.6 508,032,000
21.7 40,320
21.8 12,376
21.9 48,828,125
21.10 150,392,960
21.11 256
21.12 1,632,960

Second half problems (5.5-5.8)

21.13 220
21.14 50,400
21.15 27,720
21.16 3876
21.17 25
21.18 10

A pizza place is offering a special on 3-topping pizzas. If the restaurant offers 11 different kinds of toppings, how many different 3-topping pizzas could be made?

21.1

If you receive one PowerPoint slide from each of six team members, how many different ways could these be ordered for a final presentation?

21.2

Four people walk into a karaoke bar wanting to sing their favorite song. If the machine has a library of 80 songs, how many different ways could the group choose favorite songs? (Do not consider the order of the performances.)

21.3

A wedding DJ has a list of 15 songs from which to construct a playlist of 8 songs for the first part of the reception. How many different playlists could be created? (Different orderings of the same songs count as different playlists.) 21.4	Downloading songs for a road trip, you wish to choose 6 of the 10 Billy Joel songs you have, 5 of the 8 Paul Simon songs, and 4 of the 9 Elton John songs. How many ways could these songs be downloaded? (Do not consider the order.) 21.5
Creating a slide show of your vacation, you want to pick 3 of your 7 photos from Florence, then 4 of your 6 photos from Rome, and finally end with 5 of your 8 photos from Sicily. How many slide shows could you create? (Order matters.) 21.6	How many different ways could 8 different collectible figurines be placed in a row along a shelf? 21.7

How many ways could a volleyball coach select a starting line-up of six players from a team of 17 players? 21.8	During a literature course, each of the eleven students read five novels. For the final paper, each student picked their favorite book for additional analysis. How many ways could the class make their selections? 21.9
A game master must build a deck of monsters for his adventure. He needs to choose one monster for each of the seven levels of the game, and he has 18 monsters to choose from (no repeats allowed). How many ways can he build the deck? 21.10	A sandwich shop has eight different vegetable toppings. If a customer can choose any number of toppings (including all or none of them) at no extra charge, how many different ways could the customer choose toppings for her sandwich? 21.11

In a writing class of eight students, each student wrote three short stories. The instructor must choose five students to present at an event in some order, each reading one of their stories. How many different programs could be created? 21.12	A nine-headed hydra is attacking a party of four adventurers. The indistinguishable heads act independently of the others. How many ways could the nine heads distribute their attacks among the four adventurers? 21.13
A player is holding ten Skip-Bo cards. Three 1's, two 3's, one 5, one 8, and three 12's. Cards of the same value are indistinguishable. In how many different ways could these cards be ordered and played, one at a time? 21.14	An instructor has decided to award eleven students grades in the following distribution: three A's, five B's, two C's, and one D. (no one failed!) How many different ways could these grades be assigned to the eleven students? 21.15

A city purchased 15 identical red-light cameras. How many different ways could they be distributed among the five districts of the city? 21.16	A Phase 10 deck has eight cards of each number from 1 to 12. How many numbered cards must be drawn to guarantee that a player will be holding three of the same value? (Ignore the wild and skip cards in the deck.) 21.17
Of the 25 people attending a party, 11 are wearing smart watches while eight are wearing bracelets. If four of those people are wearing both a smart watch and a bracelet, how many people at the party have neither on their wrists? 21.18	