

Chapter 11 Review

1. How many different outfits can you put together if you own 3 shirts, 2 pairs of pants, and 2 pairs of runners? $3 \times 2 \times 2 = 12$ outfits

2. How many two-digit numbers can be made from the digits 2, 3, 4, 7, and 9 if no digit can be repeated?

3. a) How many arrangements can be made using all the letters of the word ABBOTSFORD? $\frac{10!}{2!2!} = 907200$

b) ~~3~~ How many arrangements can be made using all the letters of the word NEWFOUNDLAND?

$$\frac{12!}{3!2!} = 3996800$$

4. A lacrosse team's record over a season was 15 wins, 4 losses, and 2 ties.

a) In how many different orders could this record have occurred? $\frac{21!}{15!4!2!} = 813960$

b) If you know that the team started the season strongly with five straight wins, how many orders are possible for the team's results? Subtract 5 wins $\rightarrow \frac{16!}{10!4!2!} = 120120$

5. Determine the number of arrangements of the letters of the word TATTOO under each condition:

a) without further restriction $\frac{6!}{3!2!} = 60$

b) begins with a T $\frac{5!}{2!2!} = 30$

c) begins with two Ts $\frac{4!}{2!} = 12$

d) begins with three Ts $\frac{3!}{2!} = 3$

6. If there are 10 boys and 20 girls in the class, how many ways can a committee of 3 people be selected from the class if the committee must have 1 boy and 2 girls?

$${}^{10}C_1 \times {}^{20}C_2 = 10 \times 190 = 1900$$

7. How many odd 3-digit whole numbers are there? For example, 203 is acceptable but 023 is not.

$$9 \times 10 \times 5 = 450$$

8. A theatre company has 13 actors—8 men and 5 women. How many different ways are there to choose from the company a group of 6 that includes at least 4 women?

$$= {}^8C_2 \times {}^5C_4 + {}^8C_1 \times {}^5C_5 = 148$$

9. If a student must select two courses from Group A (Math 3201, Chem 3202, Physics 3204 and Biology 3201), two courses from Group B (Eng 3201, Science 3200) and one course from Group (Math 3208, Earth Systems 3208, French 3201), how many combinations are there?

$$= {}^4C_2 \times {}^2C_2 \times {}^3C_1 = 18$$

10. A student council of 5 members is to be formed from a selection pool of 6 boys and 8 girls. How many councils can have

A) Jason on the council ${}^{13}C_4 = 715$

B) Katie, but not John (5 boys now, 7 girls) ${}^{12}C_4 = 495$

C) Zach, but not Caroline, Allison or Mark (4 boys now, 6 girls) ${}^{10}C_4 = 210$

D) At least 3 boys, but one of these boys can't be Brian

$${}^5C_3 \times {}^8C_2 + {}^4C_4 \times {}^8C_1 + {}^5C_5 \times {}^8C_0 = 321$$