# Possibility and Probability Practice Sheet

**More Possibility Problems**

1. How many possible committees of 4 members can be selected from 7 people?
2. How many ways are there to seat 8 people in 8 chairs placed in a straight row?
3. In how many ways can a president and a secretary be chosen from a group of 6 people?
4. Filipe has 4 ties, 6 shirts, and 3 pairs of pants. How many different outfits can he wear? Assume that he wears one of each kind of article.
5. Six horses run in a race.
   a) How many different orders of finishing are there?
   b) How many possibilities are there for the first 3 places?
6. A political science professor must select 4 students from her class of 12 students for a field trip to the state legislature. In how many ways can she do it?
7. How many ways can the letters…
   a. PAT be rearranged?
   b. FRED be rearranged?
   c. NYITA be rearranged?
   d. CONOR be rearranged?
   e. SABINA be rearranged?
   f. WILLIAM be rearranged?
   g. REARRANGE be rearranged?

**Probability Problems**

8. What is the probability that you randomly select one card from a 52-card deck and it turns out…
   a. To be a heart?
   b. To be an 8?
   c. To be a king or a queen?
9. There are 20 marbles in a bag. 12 of them are white, 5 of them are red, and 3 of them are green. If you randomly select one marble from the bag, what is the probability that…
   a. It will be a white marble?
   b. It will be a red marble?
   c. It will be a green marble?

**More Challenging Problems**

10. If you flip one coin and roll one die, what is the probability that the die will be a 5, and the coin will be heads?
11. If you choose two cards from a 52-card deck, what is the probability that both cards will be an ace?
12. If you roll two dice, what is the probability that the first will be a 4, and the second will be a 3 or greater?
13. If you flip 5 coins, what is the probability that all of them will be heads?
14. In how many different ways can a true-false test of 10 questions be answered?
15. How many lock combinations are possible using 3 numbers from 1 to 40?
16. If you roll two dice, what is the probability that the total will be equal to ten?
17. If you flip 5 coins, what is the probability that exactly three of them will be heads?
18. Five roads connect Cheer City and Glumville.
    a. Starting at Cheer City, how many different ways can Smith drive to Glumville and back?
    b. How many different round trips can he make if he returns by a different road?
19. On a circle lie 10 points. How many chords (connecting lines) can be drawn between these points?

**Solutions**

1) ${}_7C_4 = 35$
2) $8! = 40{,}320$
3) ${}_6P_2 = 6x5 = 30$
4) $4x6x3 = 72$

5a) $6! = 720$

5b) ${}_6P_3 = 120$

6) ${}_{12}C_4 = 495$

7a) $3! = 6$

7b) $4! = 24$

7c) $5! = 120$

7d) $5!/2! = 60$

7e) $6!/2! = 360$

7f) $7!/2!2! = 1260$

7g) $9!/3!2!2! = 15{,}120$

8a) $13/52 = 25\%$

8b) $4/52 \approx 7.69\%$

8c) $8/52 \approx 15.4\%$

9a) $12/20 = 60\%$

9b) $5/20 = 25\%$

9c) $3/20 = 15\%$

10) ${}^1/_6 \times ½ = {}^1/_{12} \approx 8.33\%$

11) $4/52 \times 3/51 \approx 0.45\%$

12) $1/6 \times 4/6 \approx 11.1\%$

13) $1/32 \approx 3.13\%$

14) $2^{10} = 1024$

15) $40^3 = 64{,}000$

16) $3/36 \approx 8.33\%$

17) # ways of getting 3 heads = $5!/3!2! = 10$. Therefore $10/32 = 31.25\%$

18a) $5x5 = 25$

18b) $5x4 = 20$

19) ${}_{10}C_2 = 45$