Possibility and Probability Review problems

Note: No calculator is needed. You may leave your answers in “uncalculated form.

1. Out of a group of 10 students, how many different ways can four students be arranged in four seats.

2. How many ways are there to choose 4 different toppings on a pizza if there are 10 choices?

3. State a question for which the answer is 15P6. (The most creative question wins!)

4. Calculate (don’t use a calculator!)
   a. 3!
   b. 5!
   c. 0!
   d. 7P2
   e. 4P3
   f. 4P4
   g. 4P1
   h. 6C2
   i. 15C3
   j. 15C12
   k. 5C1
   l. 5C5
   m. 5C0

5. How many license plates are possible that start with a letter (A to Z), followed by 3 digits (0 to 9), and end with a P or W? (Repeats are allowed.)

6. How many ways are there to rearrange the letters…
   a. Math?
   b. Susan?
   c. EEEESSS?

7. How many possible routes are there on a 5x3 street grid that go from the NW corner to the SE corner?

8. Why do the last two questions have the same answer?

9. How many ways are there to choose…
   a. a 3-person committee from a group of 7?
   b. a 4-person committee from a group of 7?
   c. (Why do the last two questions have the same answer?)
   d. a 1-person committee from a group of 8?
   e. an 8-person committee from a group of 8?
   f. a 3-person committee from a group of 8?

10. Herman is going on a three-day trip. He owns 7 shirts.
    a. How many possible ways are there for him to pack 3 of his shirts to take on the trip?
    b. How many ways can he choose to wear one shirt each day for the three days given that he can wear the same shirt more than one day? (Hint: “blue, blue, green” is different from “blue, green, blue”)
    c. How many ways can he choose to wear one shirt each day for the three days given that he can’t wear the same shirt more than one day? (Hint: “red, blue, green” is different from “red, green, blue”)

11. There are 6 dogs and 4 cats in a pet store. How many ways can Bill and Kim choose one pet each if…
    a. Bill chooses a cat and Kim chooses a dog?
    b. They choose two pets and own them together.

12. How many ways are there to choose a group of 17 students out of 20 to go on a camping trip?

13. A deck of 9 cards contains 5 low cards (A,2,3,4,5) and 4 high cards (9,J,Q,K). What is the probability of…
    a. Drawing one card and having it be a high card?
    b. Drawing three cards and having them all be low cards?

14. If you flip 4 coins, what is the probability that they will all be heads?

15. If you roll two dice, what is the probability of…
    a. that the sum will be a 5?
    b. that the first die will be a 3, and the second die will be either a 5 or 6?

16. There are 12 tulip bulbs in a package. Nine are yellow tulips, and three are red tulips. If two tulips are picked from the package at random, find the probability that…
    a. Both tulips will be red.
    b. The first will be red and the second will be yellow.
    c. (Challenge!) One will be red and the other yellow.