

# Using the Fundamental Counting Principle

## *Contemporary Math (MAT-130)*

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Evaluate each expression.

1.  $5!$
2.  $(10 - 7)!$
3.  $\frac{7!}{2!}$
4.  $\frac{25!}{24!}$
5.  $\frac{11!}{3!(11-3)!}$
  
6. How many possible outcomes are there if a coin is flipped six times?
7. How many six digit passwords can be made using only numbers?
8. How many six digit passwords can be made using only numbers if no digit is repeated?
9. How many four digit passwords can be made using only letters?
10. How many four digit passwords can be made if numbers and letters may be used?
11. How many six digit license plates can be made in the form LLLNNL. L stands for a letter and N stands for a number.
12. If John has 4 shirts, 5 pairs of pants, and 2 pairs of shoes, how many different outfits can he make?
13. If you are taking a ten question multiple choice test where each question has five choices, how many different ways can you mark your answer sheet if you answer every question?
14. How many three digit numbers are multiples of five?
15. How many 4 digit numbers can be made with the digits  $\{0, 1, 2, 3, 4, 5\}$  if each digit can only be used once?

Problems 16-20 involve the club  $\{\text{Allan, Bill, Cathy, David, Evelyn}\}$ . In how many ways could they do each of the following?

16. Schedule one member to work on each of five different days if members cannot work more than one day.
17. Select a president and vice president if the president must be a man and the vice president a woman.
18. Line up the members for a photograph if Bill is taking the picture.
19. Enter a building if all the women enter before the men.
20. Select a president, vice president, treasure, and secretary if the president and vice president must be men.

Find the number of distinguishable arrangements of the letters in each word.

21. Fragile
22. Seeder
23. Bookkeeper
24. Banana

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### Solutions:

1. 120
2. 6
3. 2520
4. 25
5. 165
6. 64
7. 1000000
8. 151200
9. 456976
10. 1679616
11. 45697600
12. 40
13. 9765625
14. 180
15. 300
16. 120
17. 6
18. 24
19. 12
20. 36
21. 5040
22. 120
23. 151200
24. 60