

# Counting Problems Involving “Not” and “Or”

## Contemporary Math (MAT-130)

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Find the number of proper subsets for each set.

1.  $\{1, 2, 3, 4\}$
2. The set consisting of days of the week
3.  $\{ab, cd, ef\}$
4.  $\emptyset$
5.  $\{x \mid x \text{ is a month}\}$

Use the complements principal of counting to solve the following problems.

6. How many three digit numbers are not multiples of five?
7. How many ways are there to not roll doubles if two fair dice are rolled?
8. A committee of 3 people is chosen from a group of 6 men and 4 women. How many such committees can be formed if they cannot be all men?
9. How many ways are there to get at least 2 heads if you flip a coin seven times?
10. How many ways are there to arrange 5 different letters so that they are not in alphabetical order?
11. How many ways are there to pick a face card from a standard deck that is not a queen?
12. How many different poker hands are not club flushes (in a club flush all the cards are clubs)?

Use the additive principle of counting to solve the following problems.

13. If a single dice is tossed, how many ways are there to get a multiple of 2 or a multiple of 3?
14. If a card is chosen from a standard deck how many ways are there to get a spade or a face card?
15. A committee of 4 people is chosen from a group of 6 men and 5 women. How many such committees can be formed that are all men or all women?
16. How many three digit numbers are greater than 899 or less than 300?
17. How many poker hands are flushes (in a flush all the cards are the same suit)?
18. The following table shows the contents of Peter’s closet. How many outfits could Peter make if he wants to wear something blue?

Shirts	Pants	Shoes
2 red	5 blue	2 white
3 blue	2 green	1 brown
1 white	3 khakie	1 black
3 black	1 black	

19. How many outfits could Peter make if he wants to wear something white?
20. A class president, vice president and secretary must be chosen from a group of 4 juniors, 3 sophomores, and 5 seniors. How many ways can the offices be filled if the president or vice president is a senior?

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1. 15
2. 127
3. 7
4. 0
5. 4095
6. 720
7. 30
8. 100
9. 120
10. 119
11. 8
12. 2597673
13. 4
14. 22
15. 20
16. 300
17. 5148
18. 252
19. 220
20. 900