1) Suppose Friendly's has a $6.99 dinner option where you get to pick a soup, a sandwich, and a milk shake.
You have 2 choices for soup: Clam Chowder and Tomato Soup
You have 3 choices for sandwiches: Grilled Cheese, Turkey, and BLT
You have 3 choices for milk shakes: Vanilla, Chocolate, and Strawberry
If you are allowed to pick one soup, one sandwich, and one milk shake, how many different dinner combinations are there?

_____

(An example of a dinner combination is Tomato Soup, Grilled Cheese, and a Vanilla milk shake.)

1 $2 \cdot 3 \cdot 3 = 18$

2)How many different three-digit numbers can be formed from the numbers {1,2,3,4,5,6,7,8,9}? _____

2 $9^3 = 729$

3) How many different three digit numbers (using 1-9) can be formed from these numbers if the digits in the number are to be **different** (i.e., 323, 233, or 333 are not allowed)? _____

3 $9 \cdot 8 \cdot 7 = 504$

4) Suppose the New Jersey license plates have 3 ~~numbers~~ digits followed by 3 letters. How many different license plates are possible this way? _____

4 $10^3 \cdot 26^3$ 17,576,000

5) If there are 10 people at a meeting and every person shakes hand with every other person in the room ~~except herself~~, how many handshakes occur?

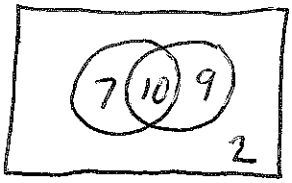
$9+8+7+6+5+4+3+2+1 = 45$

5

6) Of the 28 students in Mr. Scevola's class 19 students watch The Bachelor and 17 students watch Modern Family. 2 students watch neither. Draw a Venn Diagram depicting as much information as possible.

$A \cap B = 19 +$
$26 = 19 + 17 - A \cap B$

6



7) Given that U = {1,2,3,4,5,6,7,8,9}, list the elements in the following set A = {x: 5x > 37}.

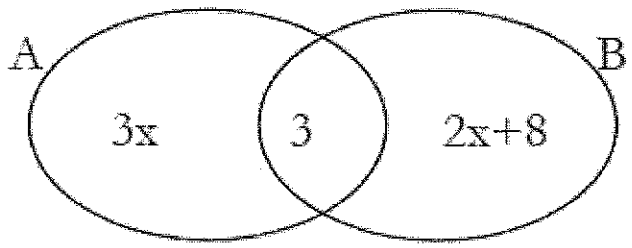
A

7 $A = \{8, 9\}$

8) Given that U = {1,2,3,4,5,6,7,8, 9}, list the elements in the following set B = {x + 5 < 12}.

8 $\{1,2,3,4,5,6\}$

9) Given the picture below, use the inclusion – exclusion principle to find n(AUB).



$n(A \cup B) = 3x+3+2x+8+\cancel{3}-\cancel{3}$

$= 5x+11$

9 $5x+11$

10) Let U = {p,q,r,s,t,u,v,w}, A={p,q,r,s}, B={r,s,t}, C={s,t,u,v,w}. List the elements of A∩B∩C

10 $\{s\}$

11) If 10 runners compete in a race, how many different ways can prices be awarded for 1st, 2nd and 3rd place?

11 $\frac{10!}{7!} = 10 \cdot 9 \cdot 8 = 720$

12) The "home row" on a standard keyboard gives one arrangement of the letters A, S, D, F, G, H, J, K, L. How many *other* arrangements of these letters are possible.

12 $9! - 1 = 362879$

13) The top row on a keyboard is the arrangement of the following letters: Q, W, E, R, T, Y, U, I, O, P. How many possibilities were there for the top row of letters on a keyboard? write is out as a product (actual # is too big).

13 $\frac{26!}{16!} = 26 \cdot 25 \cdot 24 \cdot 23 \cdot 22 \cdot 21 \cdot 20 \cdot 19 \cdot 18 \cdot 17$

14) In how many ways can 4 people be seated in a row of 12 chairs?

14 $\frac{12!}{8!} = 12 \cdot 11 \cdot 10 \cdot 9$ 11880