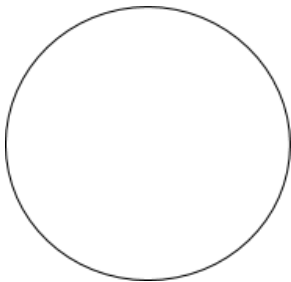


1. Consider the sample space of integers 1-25 {1, 2, 3, 4,.....23, 24, 25}.

a. In circle A list all the factors of 24

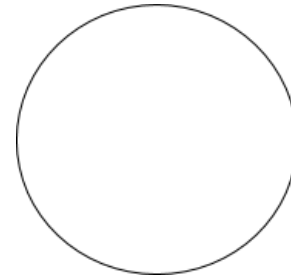
b. In circle B list all the factors of 18

A



How many factors?

B

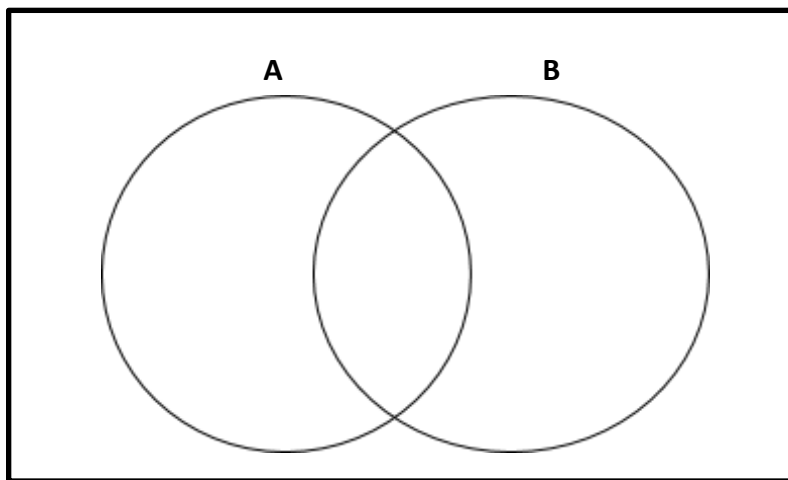


How many factors?

c. What factors do they have in common? _____

Write those factors in the Venn diagram in the space where circle A and circle B overlap. These numbers are the intersection of lists A and B ($A \cap B$).

Sample Space {Integers 1-25}



e. Now place the rest of the factors of 24 in circle A but NOT in the intersection and the rest of the factors of 18 in circle B but NOT in the intersection. All the numbers now in diagram represent the union of the two lists ($A \cup B$). Integers from our sample space that are either a factor of 24 and/or factor of 18.

f. Place the remaining integers from our sample space {1-25} that are neither a factor of 24 or a factor of 18 in the box outside the circles. These numbers are the complement of the two lists. $P(A \cup B)^c$

g. Use your Venn Diagram to find the probabilities if you randomly select an integer from 1-25.

$P(\text{Factor of } 24 \cap \text{Factor of } 18) =$

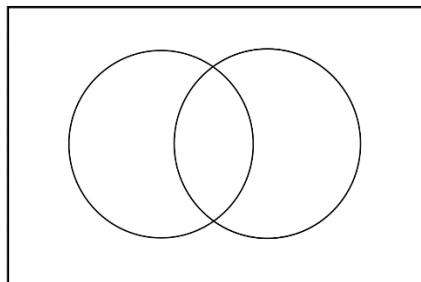
$P(\text{Factor of } 24 \cup \text{Factor of } 18) =$

$P(\text{Factor of } 24 \cup \text{Factor of } 18)^c =$

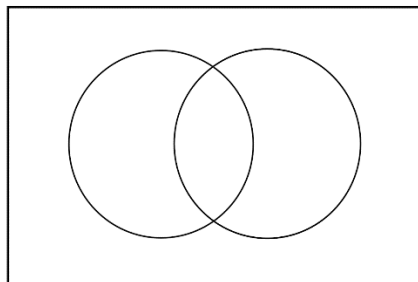
Definitions:

Intersection: $P(A \cap B)$: The probability of an event having *both* characteristics of **A and B**.
 Union: $P(A \cup B)$: The probability of an event having *either* of the characteristics of **A or B**.
 Complement: $P(A \cup B)^c$: The probability of an event having *neither* the characteristics. **Not A or B**.

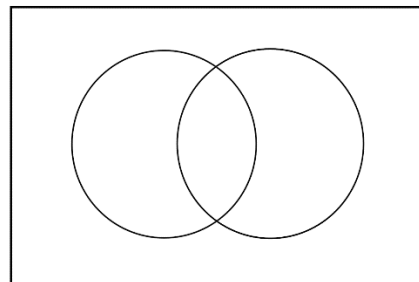
2. Shade the appropriate area of each Venn Diagram below:



$(A \cap B)$

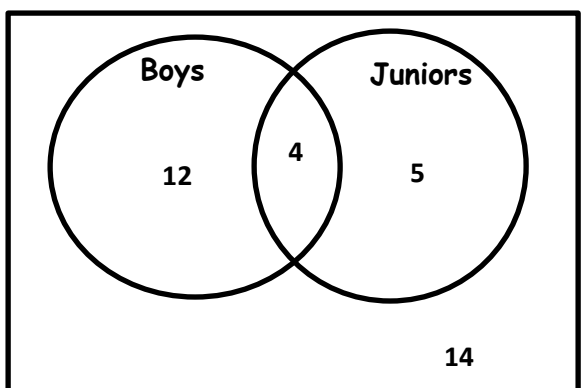


$(A \cup B)$

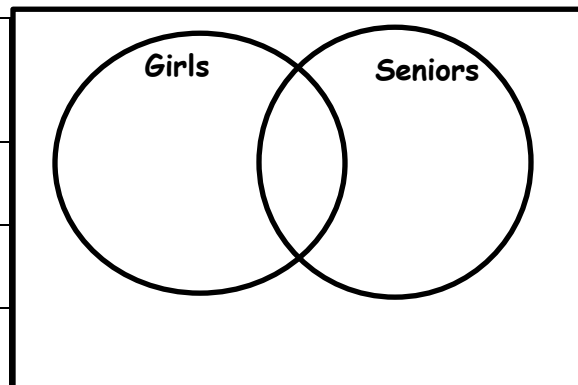


$(A \cup B)^c$

3. Use the Venn diagram on left to answer the questions below (there are only juniors and seniors in this class). Then complete the diagram at right for the same class.



Total # of students in the class:
Total # of boys:
Total # of girls:
Total # of juniors:
Total # of seniors:



Calculate the probability if I chose one student at random:

$P(\text{Boy} \cap \text{Junior}) =$	Explain what you did:
$P(\text{Boy} \cup \text{Junior}) =$	Explain what you did:

To find the union of events we use the **General Addition Rule**:

Probability of A or B = Probability of A + Probability of B - Probability of both

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$