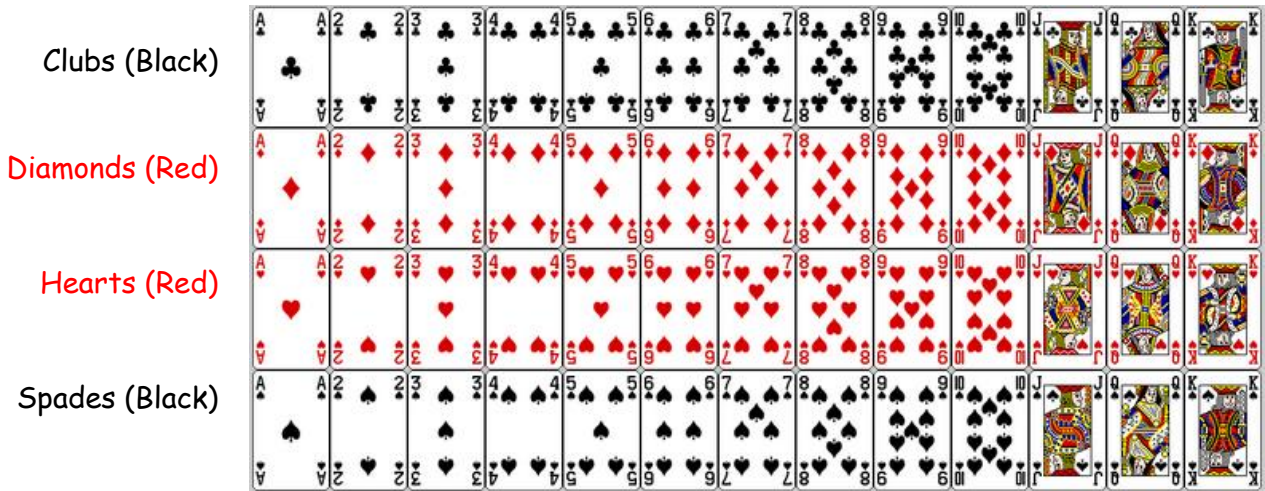


Unions and Intersections

1. In a standard deck of cards, there are 52 cards. There are four "suits" with 13 cards in each. Jacks, Queens, and Kings are considered "face cards." Aces can be high or low, but not both.



Find the following probabilities based on a standard deck of cards.

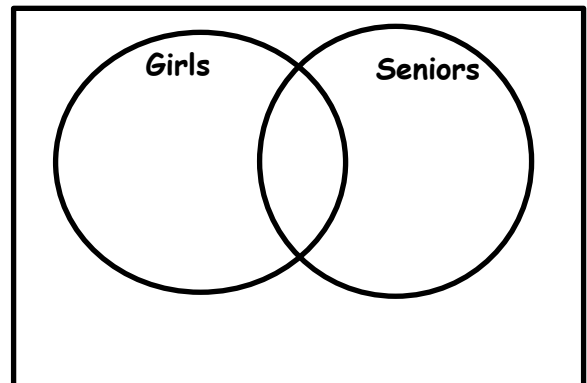
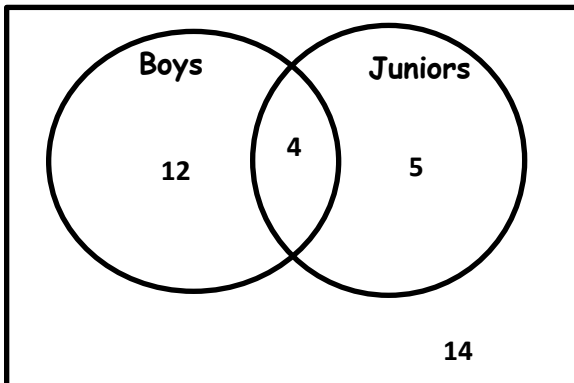
- a.  $P(\text{red}) =$
- b.  $P(\text{heart}) =$
- c.  $P(\text{red} \cap \text{heart}) =$
- d.  $P(\text{face card}) =$
- e.  $P(\text{red} \cup \text{face card}) =$
- f.  $P(\text{red} \cup \text{face card})^c =$
- g.  $P(\text{King} \cap \text{Club}) =$
- h.  $P(\text{King} \cup \text{Club}) =$
- i.  $P(\text{King} \cap \text{Queen}) =$

2. Two standard (six-sided) dice are being rolled.

Let event  $A = \{\text{the sum is a multiple of 3}\}$  and event  $B = \{\text{the sum is a multiple of 4}\}$ .

- a)  $P(A) =$
- b)  $P(B) =$
- c)  $P(A \cap B) =$
- d)  $P(A \cup B) =$

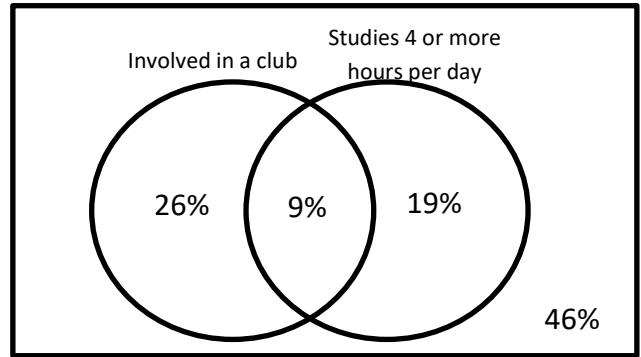
3. Using the Venn Diagrams from the investigation to answer the questions below.



- a)  $P(\text{girl} \cap \text{senior}) =$
- b)  $P(\text{junior}) =$
- c)  $P(\text{not junior}) =$
- d)  $P(\text{girl} \cup \text{senior})^c =$
- e)  $P(\text{boy} \cap \text{senior}) =$
- f)  $P(\text{not a boy} \cap \text{not junior}) =$
- g)  $P(\text{junior} \cup \text{senior}) =$
- h)  $P(\text{junior} \cap \text{senior}) =$

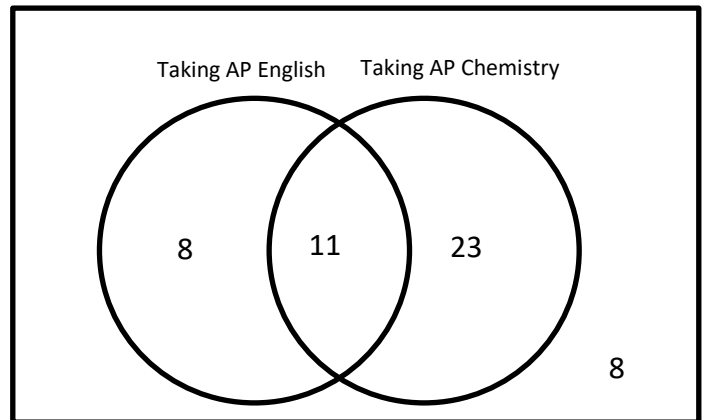
4. In a random sample of 10,000 college students, a research company found that 35% were involved in a club and 28% studied four or more hours per day. When they reported their findings, the research company indicated that 54% were either involved in a club or studies four or more hours per day.

- a. Find the probability that a college student is involved in a club and studies four or more hours per day.
- b. What is the probability that a college student studies four or more hours per day, but is not in a club?



5. In a group of 50 students, 19 are taking AP English and 34 are taking Chemistry, and 8 are taking neither. Find each probability for a random student:

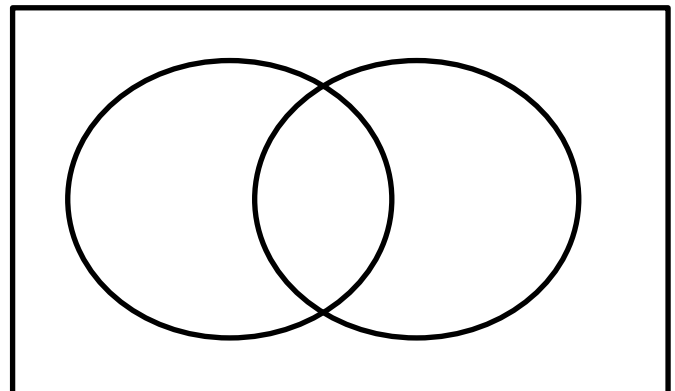
- a.  $P(\text{AP English}) =$
- b.  $P(\text{Chemistry}) =$
- c.  $P(\text{AP English} \cup \text{Chemistry}) =$
- d.  $P(\text{not Chemistry}) =$
- e.  $P(\text{AP English} \cap \text{Chemistry}) =$



- f.  $P(\text{AP English} \cup \text{Chemistry})^c =$

6. In a random sample of high school students, a research company found that 25% played a sport 57% were taking a music class, and 10% did both. Fill in the Venn diagram and find each probability for a random student:

- a.  $P(\text{sport} \cap \text{not music}) =$
- b.  $P(\text{music} \cap \text{not sport}) =$
- c.  $P(\text{music} \cup \text{sport}) =$
- d.  $P(\text{music} \cap \text{sport}) =$



- e.  $P(\text{music} \cup \text{sport})^c =$