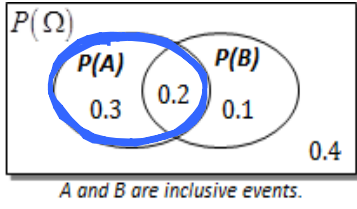


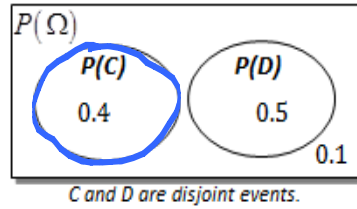
**MUTUALLY EXCLUSIVE (Disjoint) EVENTS vs. INCLUSIVE EVENTS**

1. Consider the VENN diagrams at the right to help you answer the following.

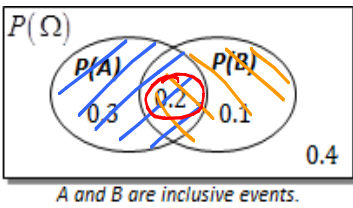
A.  $P(A) = 0.3 + 0.2$  Decimal: 0.5



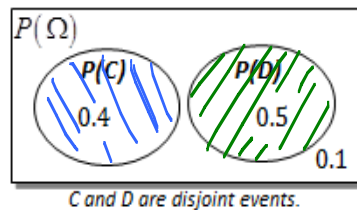
F.  $P(C) = 0.4$  Decimal: 0.4



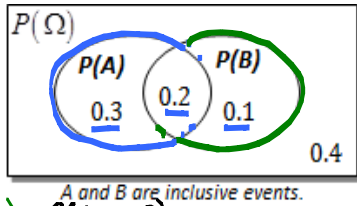
B.  $P(A \text{ and } B) = P(A \cap B) = 0.2$  Decimal: 0.2



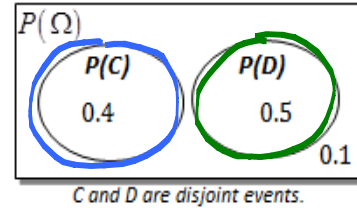
G.  $P(C \text{ and } D) = P(C \cap D) = 0$  Decimal: 0



C.  $P(A \text{ or } B) = P(A \cup B) = 0.6$  Decimal: 0.6

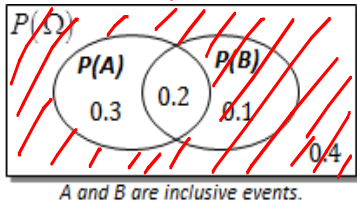


H.  $P(C \text{ or } D) = P(C \cup D) = 0.4 + 0.5$  Decimal: 0.9

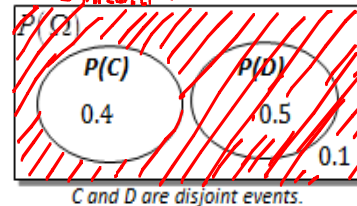


$P(A) + P(B) - P(A \text{ and } B) = 0.5 + 0.3 - 0.2 = 0.6$

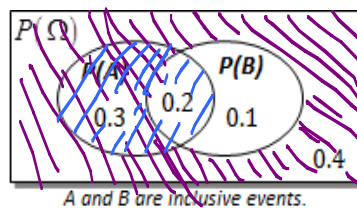
D.  $P(A^c) = P(A') = 0.1 + 0.4 = 0.5$  Decimal: 0.5



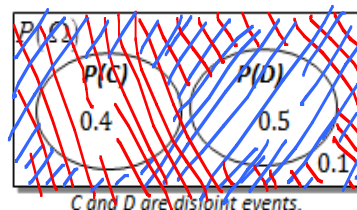
I.  $P(C^c) = P(C') = 0.5 + 0.1 = 0.6$  Decimal: 0.6



E.  $P(A \text{ and } B^c) = P(A \cap B') = 0.3$  Decimal: 0.3

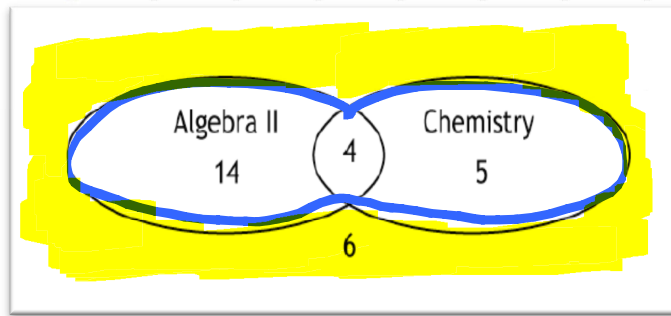


J.  $P(C^c \text{ and } D^c) = P(C' \cap D') = 0.1$  Decimal: 0.1



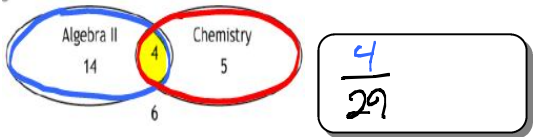
$P(C^c \text{ or } D^c) = 0.4 + 0.5 + 0.1 = 1$

2. Ms. Snow conducted a survey of her homeroom. She asked students what math course and what science course they were taking this semester. Below are the results.



TOTAL = 29

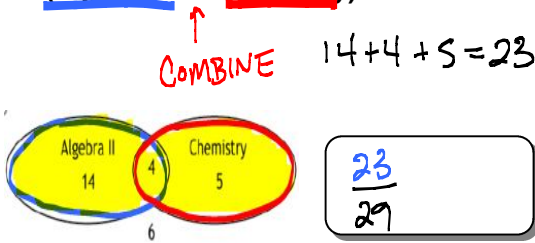
- a. If a student is selected at random from Ms. Snow's homeroom, what is the probability that the student is taking Algebra II and Chemistry?



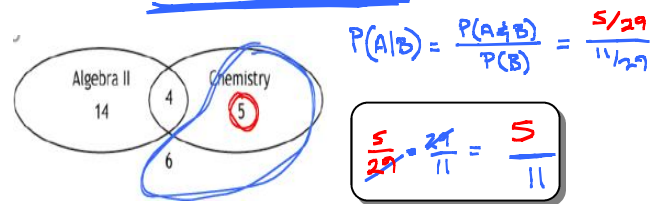
- c. If a student is selected at random from Ms. Snow's homeroom, what is the probability that the student is not taking either Algebra II or Chemistry?  $P(\text{Algebra II or Chemistry})^c$



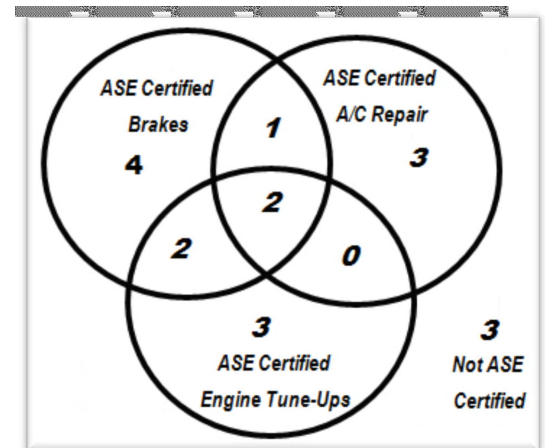
- b. Find the probability:  $P(\text{Algebra II or Chemistry})$ .



- d. Find the probability of a student taking Chemistry, given that the student is not taking Algebra II, or  $P(\text{Chemistry} | \text{not taking Algebra II})$ .

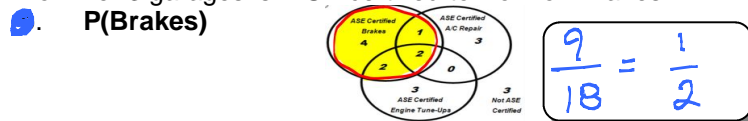


3. A manager that owns 3 local area Car Maintenance Garages was researching certifications of mechanics that worked for her company. Consider the following Venn diagram.

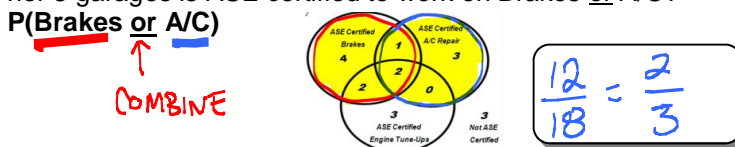


TOTAL = 18

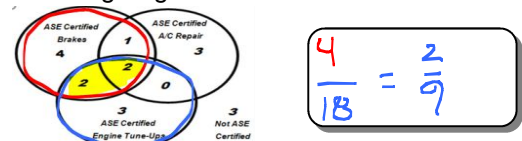
- a. What is the probability that a randomly selected mechanic from her 3 garages is ASE certified to work on Brakes?



- c. What is the probability that a randomly selected mechanic from her 3 garages is ASE certified to work on Brakes or A/C?



- d. What is the probability that a randomly selected mechanic from her 3 garages is ASE certified to work on Brakes and Engine Tune-Ups?  $P(\text{Brakes and Tune-Ups})$



- e. What is the probability that a randomly selected mechanic that is certified in Brakes given that the mechanic is certified to do Tune-Ups?  $P(\text{Brakes} | \text{Tune-Ups})$

