

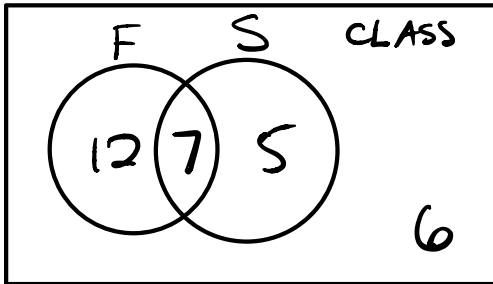
## Venn Diagrams

Hw Section P.1 &amp; P.3

### That's Foreign to Me

In a class of 30 students, 19 are studying French, 12 are studying Spanish and 7 are studying both French and Spanish

P.1: Show the sample space

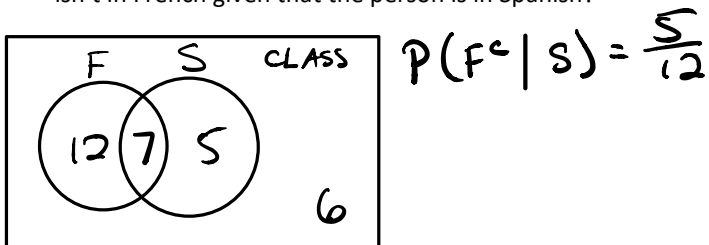


P.1: If you choose a student at random, what is the probability the student is not taking a foreign language?

$$P(F^c \text{ and } S^c) = \frac{6}{30} = \frac{1}{5}$$

$$P(\text{not } F \text{ and not } S)$$

P.3: What is the probability of choosing someone who isn't in French given that the person is in Spanish?



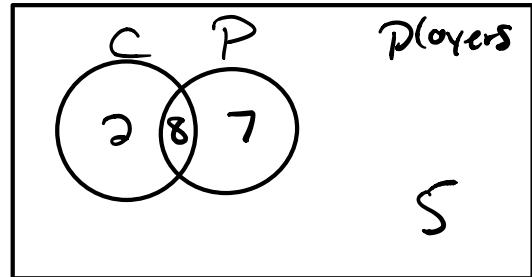
P.3: What is the probability of choosing a person who does not take Spanish, given that the person is in French?

$$P(S^c | F) = \frac{12}{19}$$

### Concussed Boogers

On a football field of 22 players, 10 of the players have had a concussion, 15 of the players have picked their nose in public, and 8 of the players have had both a concussion and picked their nose in public.

P.1: Show the sample space

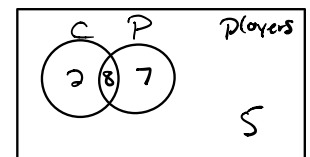


P.1: If you choose a player at random, what is the probability that he has had a concussion only?

$$P(C \text{ only}) = \frac{2}{22} = \frac{1}{11}$$

$$P.3: \text{ Find } P(C|P) = \frac{8}{15}$$

$$P.3: \text{ Find } P(P|C) = \frac{8}{10}$$



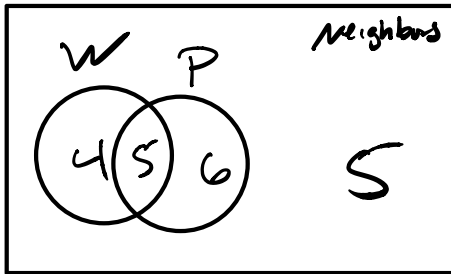
$$P.3: \text{ Find } P(P|C^c) = \frac{7}{12}$$

$$P.3: \text{ Find } P(C|P^c) = \frac{2}{7}$$

**Pool Party**

You are having a pool party with 20 of your closest neighbors. As the host you serve watermelon and popsicles. 9 of your friends eat watermelon, 11 of your friends eat a popsicle and 5 ate nothing.

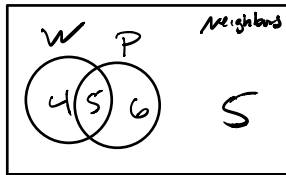
P.1: Show the sample space



P.1: If you choose a friend at random, what is the chance the friend ate both watermelon and a popsicle?

$$P(W \text{ and } P) = \frac{5}{20} = \frac{1}{4}$$

P.3: Find  $P(W|P) = \frac{5}{11}$

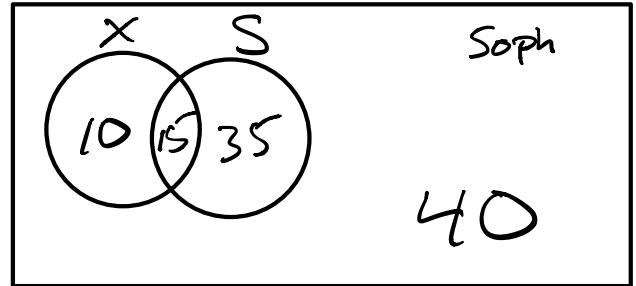


P.3: Find  $P(P|W) = \frac{5}{9}$

**Gamification**

There are 100 students in the sophomore class. Of these students, 25 own an Xbox, 50 own a Nintendo Switch and 40 don't own either.

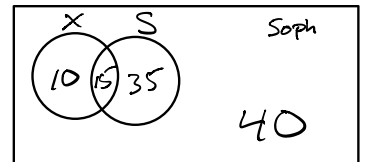
P.1: Show the sample space



P.1: If you choose a student at random, what is the chance the student owns a Nintendo Switch only?

$$P(S \text{ only}) = \frac{35}{100} = 35\%$$

P.3: Find  $P(X|N^c) = \frac{10}{50}$

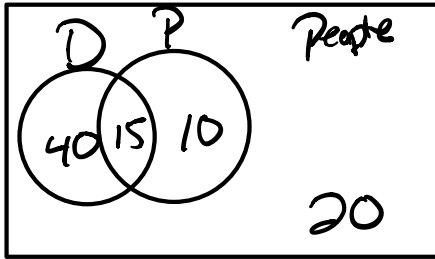


P.3: Find  $P(N^c|X^c) = \frac{50}{75}$

**Pets R Us**

In a park of 85 people, 55 are walking a dog, 25 are walking a Paradoxasaur and 20 are not walking any animal.

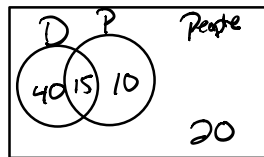
P.1: Show the sample space



P.1: If you choose a person at random, what is the probability the person is walking both a dog and a Paradoxasaur?

$$P(D \cap P) = \frac{15}{85} = \frac{3}{17}$$

P.3: Find  $P(D|P) = \frac{15}{25}$

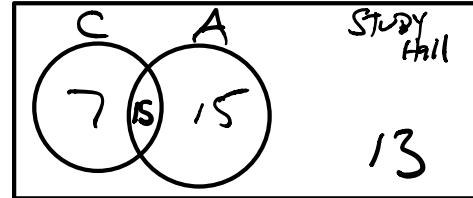


P.3: Find  $P(P|D^c) = \frac{10}{30}$

**Binary Art**

There are 10 types of people in this world, those who understand binary and those who don't. Of the 50 people in study hall, 22 of them are taking a computer course, 30 of them are taking an art class, and 15 are taking both a computer course and art class.

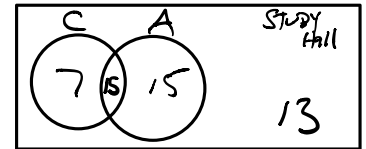
P.1: Show the sample space



P.1: If you choose a student at random, what is the chance the student only takes a computer class?

$$P(C \text{ only}) = \frac{7}{50}$$

P.3: Find  $P(A^c|C) = \frac{7}{22}$



P.3: Find  $P(C^c|A) = \frac{15}{30}$