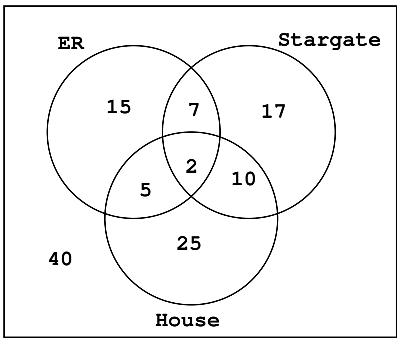
1. (a) False
   (b) True
   (c) False

2. (a) $m \wedge \sim p$
   (b) $r \wedge (m \vee p)$

3. venn diagram




4. (a) $18 + 4 = 22$
   (b) $32 + 11 = 43$
   (c) $\frac{7+4}{7+4+11+25} = \frac{11}{47}$

5. (a) $A^C = \{b, d\}$ thus $.15 + p_4 = .35$
   $p_4 = .2$ Also $p_3 = p_4 = .2$
   Since all probability adds up to 1 this gives
   $p_5 = 0.24$
   (b) $P(B|A) = \frac{P(B \cap A)}{P(A)} = \frac{.21}{.21+.2+.24} = \frac{.21}{.65}$

6. $\dfrac{10}{17}$

7. (a) $\dfrac{100 + 165 - 30}{565} = \dfrac{235}{565}$
   (b) P(football|junior) $= \dfrac{60}{222}$

8. (a) S = { EF, EG, EH, FG, FH, GH}
   (b) J = { EF, FG, FH}
   (c) many different answers.
   K ={ EF, EG}

9. first item is defective and the second item is not defective

$$\frac{6}{21} * \frac{15}{20}$$

10. (a) Use a venn diagram to get that $P(A \cap B) = 0.2$

    Since $P(A) * P(B) = 0.5 * 0.6 = 0.3$ and this is not equal to $P(A \cap B)$, A and B are not independent.

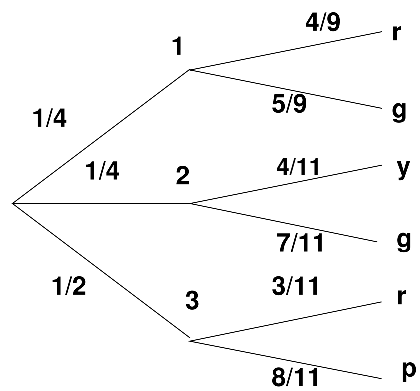
    (b) $\dfrac{P(B)}{P(B^C)} = \dfrac{0.6}{0.4} = \dfrac{3}{2}$
    Answer: 3 to 2

11. $(0.05)(0.17)(0.78) + (0.05)(0.83)(0.22)$

12. N= not a cadet, C = cadet, M = male and F = female.

    (a) $P(F \cup N) = P(F) + P(N) - P(F \cap N)$
    $0.4 + (0.4 * 0.85 + 0.6 * 0.68) - 0.4 * 0.85$
    (b) $P(F|C) = \frac{P(F \cap C}{P(C)} = \frac{0.4*0.15}{0.6*0.32+0.4*0.15}$

13. draw the tree.




since we are only looking for the color of the ball, the only outcomes are red, green, yellow. and purple. now compute the probabilities of the colors and put the results in the table.

i.e. $P(g) = \dfrac{1}{4} * \dfrac{5}{9} + \dfrac{1}{4} * \dfrac{7}{11} = \dfrac{59}{198}$

| outcomes | r | g | y | p |
|---|---|---|---|---|
| prob | $\frac{49}{198}$ | $\frac{59}{198}$ | $\frac{1}{11}$ | $\frac{4}{11}$ |