1. The probability that an event happens is 0.42. What is the probability that the event won't happen?

1 – 0.42 = 0.58

2. When two dice are rolled, the sample space consists of how many events? How many outcomes?

  There are 6 ways a die could land, so
  (# outcomes for die 1) x (3 outcomes for die 2) → (6)(6) = 36 outcomes

3. When one card is drawn from a standard deck of cards, find

  a)P(Jack)   *4 Jacks*   =   *1* *or 0.0769*
           52 cards   *13*

  b) P(4)   *4 fours*   =   *1* *or 0.0769*
          52 cards   *13*

  c) P(card less than 6) (an ace is above a 6)

    There are four cards less than 6 in each suit: 16 = *4* *or 0.3077*
                                                    52   *13*

4. When two dice are rolled, find the probability of getting

  a) a sum of 6 or 7 *There are 5 ways to get 6*   *11* *= 0.3056*
     There are 6 ways to get 7.   *36*

  b) a sum greater than 8 *9 → 4 ways*   *10* *= 0.2778*
     10 → 3 ways; 11 →2 ways; 12 → 1 way   *36*

  c) a sum that is divisible by 3
     3   6   9   12   *12* *= 0.3333*
     2 ways, 5 ways, 4 ways, 1 way   *36*

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

5. The probability that a person owns a microwave oven is 0.75, that a person owns a CD player is 0.25, and that a person owns both a microwave oven and a CD player is 0.16. Find the probability that a person owns either a microwave or a CD player, but not both.

  P(M or CD) = 0.75 + 0.25 – 0.16 = 0.84

6. Of the physics graduates of a university, 30% received starting salaries of \$30,000 or more. If 5 of the graduates are selected at random, find the probability that all had a starting salary of \$30,000 or more.
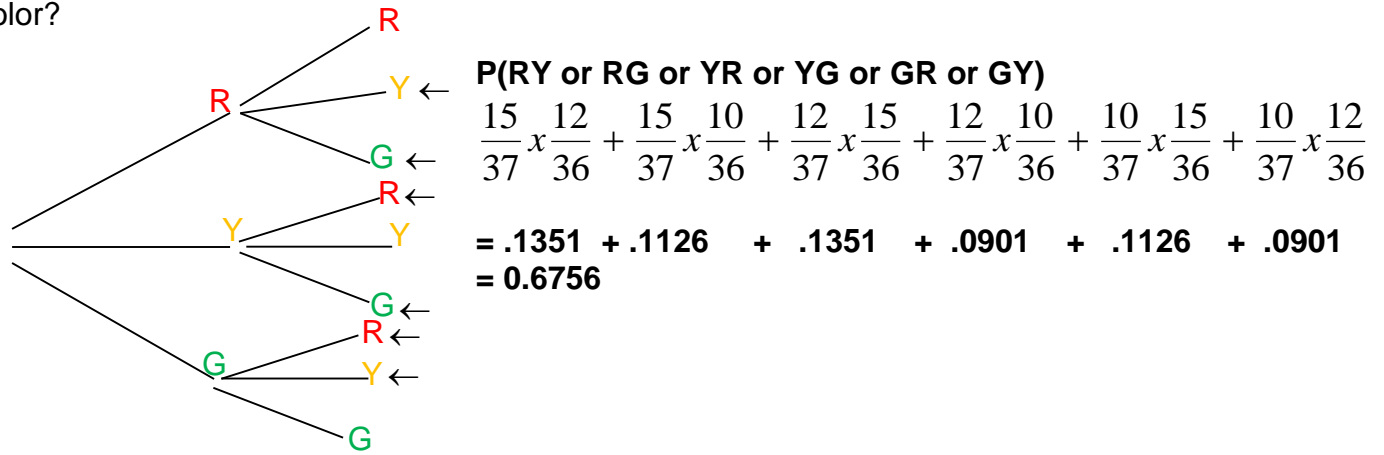
  These are independent events.
  P(1 and 2 and 3 and 4 and 5) = (0.3) (0.3) (0.3) (0.3) (0.3) = 0.0024

7. The probability that a customer will buy a car and an extended warranty is 0.16. If the probability that a customer will purchase a car is 0.30, find the probability that the customer will also purchase the extended warranty.

P(EW| Car Purchase) = P(EW and Car Pur) = *0.16* = *0.5333*
                          P(Car pur)   *0.30*

8. A bag of fruit flavored candy contains 15 red candies, 12 yellow candies, and 10 green candies. Two pieces of candy are randomly chosen without replacement. Draw a tree diagram of this experiment. What is the probability that the two candies are not the same color?

P(RY or RG or YR or YG or GR or GY)

$$\frac{15}{37}x\frac{12}{36} + \frac{15}{37}x\frac{10}{36} + \frac{12}{37}x\frac{15}{36} + \frac{12}{37}x\frac{10}{36} + \frac{10}{37}x\frac{15}{36} + \frac{10}{37}x\frac{12}{36}$$

= .1351 + .1126 + .1351 + .0901 + .1126 + .0901
= 0.6756

9. At a large factory, the employees were surveyed and classified according to their level of education and whether they attend a sports event at least once a month. The data are shown in the table.

Sports Event	Education Level		
	High School Graduate	2-Yr Degree	4-Yr Degree
Attend	16	20	24
Do Not Attend	12	19	25

If an employee is selected at random, find the probability that

      a) the employee attends sports events regularly given that he or she graduated from college. (2 or 4-year degree)

P(Attend| 2 or 4) = # in both = *44* = *1* or *0.500*
                    # 2 or 4   *88*   *2*
      b) Given that the employee is a high school graduate, he or she does not attend sports events regularly.

P(Not Attend| HS) = # in both = *12* = *3* or *0.4286*
                  # HS   *28*   *7*

      c) a randomly chosen person regularly attends sports events and has a two-yr degree.

P(Attend and 2 or 4) = 20 =   *5* = *0.1724*
                  116   *29*

d) a randomly chosen person is a high school graduate or regularly attends sports events.

$P(HS\ or\ Attends) = \dfrac{28}{116} + \dfrac{60}{116} - \dfrac{16}{116} = \dfrac{72}{116} = \dfrac{18}{29}$ or 0.6207

e) Are the events "Four-year degree" and "Attend" independent? Justify mathematically.

$P(4) = P(4\mid Attend)$ **OR** $P(Attend) = P(Attend\mid 4)$

$\dfrac{49}{116}$ $\dfrac{24}{60}$ $\rightarrow\rightarrow 0.4224 \neq 0.4$ $\dfrac{60}{116}$ $\dfrac{24}{49}$ $\rightarrow\rightarrow .5172 \neq .4898$

Therefore, the events are not independent.

9. Two events that cannot occur at the same time are said to be…

Mutually Exclusive