1) Below are the counts (in thousands) of earned degrees in the United States in a recent year, classified by level and by the sex of the degree recipient. **One person is selected at random**, find the following probabilities.

|  | Bachelor's | Master's | Professional | Doctorate | Total |
|---|---|---|---|---|---|
| **Female** | 616 | 194 | 30 | 16 | 856 |
| **Male** | 529 | 171 | 44 | 26 | 770 |
| **Total** | 1145 | 365 | 74 | 42 | 1626 |

    a. Probability of a female.

    b. Probability of having a master's degree.

    c. Probability of a female and a doctorate.

    d. Probability of a male and bachelor's.

    e. Probability of master's or professional.

    f. Probability of female or bachelor's.

    g. Probability of male or female.

    h. Probability of bachelor's or male.

    i. Probability of female given she has a doctorate.

    j. Probability of master's given he is male.

    k. Are the events "choose a male" or "choose a doctorate degree recipient" exclusive or inclusive?

2) Andrea is a very good student. The probability that she studies and passes her mathematics test is $\frac{17}{20}$. If the probability that Andrea studies is $\frac{15}{16}$, find the probability that Andrea passes her mathematics test, given that she has studied.

3) A 6-sided die is tossed. Find $P(less\,than\,5\,|\,even)$.

4) A number is selected, at random, from the set $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$. Find:

    a. $P(odd)$

    b. P(*odd and prime*)

    b. P(*even or power of 3*)

    c. P(*even or prime*)

    d. P(*power of 2 or even*)

    e. $P(prime\,|\,odd)$

    f. $P(multiple\,of\,\,3\,|\,prime)$

5) A box contains three blue marbles, five red marbles, and four white marbles. If one marble is drawn at random, find:

      a. $P(blue \mid not\ white)$                                           b.  $P(not\ red \mid not\ white)$

6) Choose an employed person at random. Let A be the event that the person chosen is a woman, and B the event that person holds a managerial or professional job. Government data tells us that $P(A) = .46$ and the probability of managerial and professional jobs among women is $P(B \mid A) = .32$. Find the probability that a randomly chosen employed person is a woman and holds a managerial or professional position.

7) Suppose there are 1000 first-year students at a certain university. Two hundred are taking French but not statistics, one hundred are taking statistics but not French, and another 50 are taking both French and statistics. If you pick a student at random, find the following probabilities:

      a. $P(is\ taking\ French)$                                b. $P(is\ taking\ French\ or\ statistics)$

      c. $P(is\ not\ taking\ French)$                          d. $P(is\ taking\ neither\ French\ nor\ statistics)$

8) Using a standard deck of cards, find the probability of the following: (for parts a – h only 1 card is selected)

      a. $P(face\ card)$                                     b. $P(black\ card\ or\ 7)$

      c. $P(heart\ and\ face\ card)$                        d. $P(K\ or\ card\ less\ than\ 5 – Ace\ low)$

      e. $P(red\ card\ or\ card\ greater\ than\ 10 – Ace\ low)$     f.  $P(heart \mid face\ card)$

      g. $P(spade \mid less\ than\ 8 – Ace\ low)$                h.  $P(face\ card \mid Ace)$

      i. $P(a\ spade,\ then\ 2\ hearts,\ then\ 1\ club,\ then\ 1\ diamond – without\ replacement)$