Math 483   HW 2 2023   Due Monday, Aug. 28. Two pages, problems A)-C).

YOU ARE BEING GRADED FOR WORK NOT JUST THE FINAL ANSWER. As a rule of thumb,
you should have some idea of what you were doing, even without the book.
You are encouraged to form groups to discuss ideas and HW problems, but do not
copy. Problems from section 2.4.
problem
A) 2.10 The proportions of blood phenotypes, A, B, AB, and O, in the
         population of all Caucasians in the United States are
         approximately 0.41, 0.10, 0.04 and 0.45, respectively.
         A single Caucasian is chosen at random from the population.

         a) List the sample space for this experiment.
         b) Make use of the information given above to assign
            probabilities to each of the sample events.
         c) What is the probability that the person chosen at random
            has either type A or type B blood?

Comment: See ex. 2.1 on p. 31. Part c is modified from problem 2.10c.

B) 2.15   An oil prospecting firm hits oil or gas on 10% of its drillings.
           If the firm drills two wells, the four possible simple events and
           three of their associated probabilities are given in the table below.

Simple Event	Outcome of First Drilling	Outcome of Second Drilling	Probability
E1	Hit (oil or gas)	Hit (oil or gas)	0.01
E2	Hit	Miss	?
E3	Miss	Hit	0.09
E4	Miss	Miss	0.81

           a) Find the probability that the company will hit oil or gas on
              the first drilling and miss on the second.

           b) Find the probability that the company will hit oil or gas on
              at least one of the two drillings.

comment: For a) use the fact that the probabilities sum to one.
           For b), find the sample points in the event, then sum
           their probabilities.

C) (not in text but do it). Consider tossing two die. The sample space S consists of 36 outcomes. a) On your homework paper, make a table like the one below and fill in the 36 possible outcomes. Interpret an outcome such as (5,4) to mean that the first die was a 5 and the second die a 4.

```
                        second die
      ____1_____2_____3_____4_____5_____6_____
     1 | (1,1)     (1,2)
       |
f    2 |
i      |
r    3 |
s      |
t    4 |
       |
d    5 |                               (5,4)
i      |
e    6 |
```

b) Find the probability that the sum of the two die was equal to k, for k = 2 to 12. Present your answer in a table of the form shown below.

k	2	3	4	5	6	7	8	9	10	11	12
P(k)	1/36	2/36									

(Hint: look at diagonals running from SW to NE. The entries on these diagonals sum to a fixed value of k. For example the diagonal formed by (1,1) sums to 2. The diagonal formed by (2,1) and (1,2) sums to 3. Hence there are two sample points such that the sum is equal to 3. Each sample point has probability = 1/36, so P(k = 3) = 2/36.)