Probability Review

1. A bag contains 16 marbles. Four are red, ten are blue, and 2 are green. Find the following probabilities:
   a. P(red or green)

      ME.: $4/16 + 2/16 - 0/16$ $\boxed{3/8}$

   b. Probability of drawing red on the first draw, blue on the second draw, and green on the third draw **with replacement**.

      $\frac{4}{16} \cdot \frac{10}{16} \cdot \frac{2}{16}$ $\boxed{5/256}$

   c. Probability of drawing three blue marbles in a row, **without replacement**.

      $\frac{10}{16} \cdot \frac{9}{15} \cdot \frac{8}{14}$ $\boxed{3/14}$

   d. Probability of drawing a red marble on the second draw, given you got green on the first draw.

      (2nd R | 1st G) $\frac{4}{15}$ $\boxed{4/15}$

2. Julie spins a spinner with 8 equal sections numbered 1-8. Find the following probabilities.
   a. Probability of spinning an even number, or a number greater than 5.

      1 2 3 4 5 6 7 8 $4/8 + 3/8 - 2/8$ $\boxed{5/8}$

   b. Probability of spinning and even number given that you got a number greater than 5.

      6, 7, 8 $2/3$ $\boxed{2/3}$

   c. Probability of spinning an even number and a number greater than five.

      1 2 3 4 5 6 7 8 $2/8$ $\boxed{1/4}$

3. Two dice are rolled. The chart below shows the possible sums. Find the following probabilities.

	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

   a. P (sum of six or sum of 10)

      $8/36 =$ $\boxed{2/9}$

   b. P(Sum of six and sum of 10) $\boxed{0}$

   c. P(even sum or sum greater than 9)

      $\frac{18}{36} + \frac{6}{36} - \frac{4}{36} = \frac{20}{36}$ $\boxed{5/9}$

   d. P(even sum | sum greater than 9)

      $4/6 =$ $\boxed{2/3}$

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4. Find the following Probabilities according to the table.

	SUV	Compact	Mid Size	
Foreign	20	50	20	90
Domestic	65	100	45	210
	85	150	65	300

a. P(Domestic) $\frac{210}{300} = \boxed{7/10}$

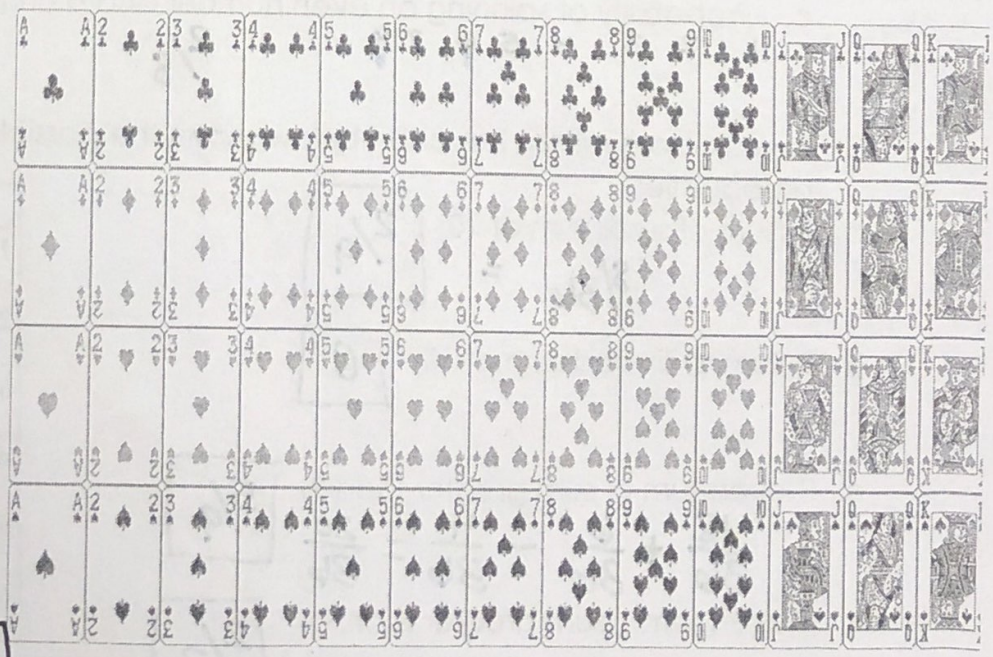
b. P(Compact and Foreign) $50/300$ $\boxed{1/6}$

c. P(Domestic or SUV) $\frac{210}{300} + \frac{85}{300} - \frac{65}{300}$ $\boxed{\frac{23}{30}}$

d. P(Midsized | Domestic) $45/210$ $\boxed{3/14}$

e. P(Domestic)' $\frac{90}{300} = \boxed{3/10}$

5. The following questions are based on a **standard deck of cards**.



a. Find the probability of drawing a 4 and then a king, without replacement. $\boxed{\frac{4}{663}}$

$\frac{4}{52} \cdot \frac{4}{51} =$

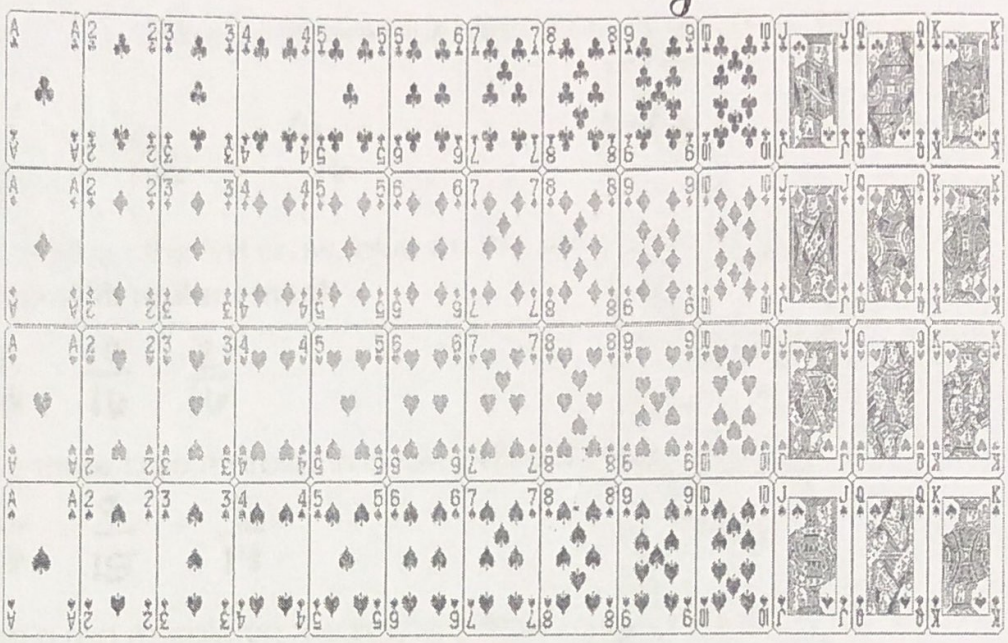
b. Probability of a Club and then Diamond without replacement.

$\frac{13}{52} \cdot \frac{13}{51}$ $\boxed{\frac{13}{204}}$

c. Two sevens in a row without replacement.

$\frac{4}{52} \cdot \frac{3}{51}$ $\boxed{\frac{1}{221}}$

Probability Review



d. A heart and then a seven with replacement.

$\frac{13}{52} \cdot \frac{4}{52} = \frac{52}{2704}$ $\boxed{1/52}$

e. Probability of both are hearts with replacement.

$\frac{13}{52} \cdot \frac{13}{52} = \frac{169}{2704}$ $\boxed{\frac{1}{16}}$

f. Probability of Heart or a club.

$\frac{26}{52}$ $\boxed{1/2}$

g. Probability of Heart and Club. (Think: only one draw is happening) $\boxed{0}$

h. Probability of drawing a card with a letter on it or a face card. $\boxed{4/13}$

$\frac{16}{52} + \frac{12}{52} - \frac{12}{52}$

i. Probability of drawing a heart or a card with an even number on it. $\boxed{7/13}$

$\frac{13}{52} + \frac{20}{52} - \frac{5}{52} = \frac{28}{52}$.

$P(A|B) = \frac{P(A \cap B)}{P(B)}$

$= \frac{.14}{.7}$

6. Answer the questions given the following Probabilities

Events C and D are independent and P(C)= .2 and P(D)=.7

Find: a. P(C $\cap$ and D) = .14

$P(A \cap B) = P(A) \cdot P(B)$.

$.14 = .2 \cdot .7$

b. P(C $\cup$ or D)= .76

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= .2 + .7 - .14$

c. P(C | D) = .2

7. **Given Events G and H with P(G) = .3 P(H) = .2 and P(G and H) = .1**

Find: a. P(G $\cup$ or H) = .4

$P(G|H) = \frac{.1}{.2}$ $\cap$

b. P(G | H) = .5

c. Are G and H Mutually exclusive? Explain. No, because .1 is the overlap.

d. Are G and H Independent? Explain. no, because

ind $P(G \cap H) \stackrel{?}{=} P(G) \cdot P(H)$

$.1 = .3 \cdot .2$

$.1 \neq .06$