Homework 6

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Question 1
(a) We will use the product rule:
$18 \cdot 325 = 5850$
There are 5850 ways we could choose our representatives.

(b) We will use the sum rule.
$18 + 325 = 343$
There are 343 ways we could choose a representative.

Question 5 We will use the product rule.
$6 \cdot 7 = 42$.
There are 42 ways to choose airlines.

Question 7
We will use the product rule.
$26 \cdot 26 \cdot 26 = 17576$
There are 17576 three letter combinations.

Question 8
We will use the product rule.
$26 \cdot 25 \cdot 24 = 15600$
There are 15600 unique three letter combinations.

Question 9
We will use the product rule.
$26 \cdot 26 = 676$.
If the first letter must be A, there are 676 three letter combinations.

Question 14
If each bit can only possibly be a 1 or a 0, then the length is n $= 2^n$. Since two positions will be fixed, the equation is altered to become n $= 2^{n-2}$.

Question 46
(a) The bride can be included in 6 ways.
The number of combinations of 5 from the available 9 is $\binom{9}{5} = 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 = 15120$.
Apply Product Rule:

$6 \cdot 15120 = 90720$

If the bride must be in the picture, there are 90720 combinations.

(b) The bride and groom can be included in 30 different ways(Product rule: $6 \cdot 5 = 30$))

The number of combinations of 4 from the available 9 is $\binom{8}{4} = 8 \cdot 7 \cdot 6 \cdot 5 = 1680$.

Apply Product Rule:

$30 \cdot 1680 = 50400$

If the bride and groom must be in the picture, there are 50400 combinations.

(c) The bride or the groom can be included in 12 ways (Product Rule: $2 \cdot 6 = 12$)

The number of combinations of 5 from the available 9 is $\binom{9}{5} = 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 = 15120$.

Apply Product Rule:

$12 \cdot 15120 = 181440$

If one of the bride and groom must be in the picture, there are 181440 combinations