§6.2 Homework Solutions

1) a) $3 \times 4 = 12$ (Multiplication Rule)
b) $3 + 4 = 7$ (Addition Rule)

5) [BB]

6) a) $26 \times 26 \times 26$ (only the first 3 positions need to be filled, the rest are automatic)
b) 26^4 (- - - - . — — — — . — — — —)
c) There are 26 1 letter palindromes, 26 with 2 letters, 26^2 with 3 letters etc.

So answer is (using addition rule) $2 \times (26 + 26^2 + 26^3 + 26^4)$

d) 19 letters (not including spaces) So first 10 characters define the palindrome $= (26)^{10}$

7) [BB]

8) a) $13 + 13 = 26$ b) $4 + 4 = 8$ c) $9 + 9 + 9 + 9 = 36$ d) $10 + 10 + 10 + 10 = 40$

16) a) 52 choices possible for first card, then 3 for second, then 2 then 1 $\Rightarrow 52 \times 3 \times 2 \times 1$

b) Case i) First 2 cards form a pair : $52 \times 3 \times 48 \times 3$
Case ii) first and third are a pair : $52 \times 48 \times 3 \times 3$
Case iii) first and last are a pair : $52 \times 48 \times 3 \times 3$.
Use Addition Rule: Answer is $52 \times 48 \times 3 \times 3 \times 3$

c) Add answers a) and b)

d) Case i) First 3 cards are same value: $52 \times 3 \times 2 \times 48$. Other 3 cases are similar.
Answer is $52 \times 3 \times 2 \times 48 \times 4$ using Addition Rule.

e) # ways of getting any 4 cards $= 52 \times 51 \times 50 \times 49$, # ways of getting no pairs $= 52 \times 48 \times 44 \times 40$
So Answer is $52 \times 51 \times 50 \times 49 - 52 \times 48 \times 44 \times 40$

17) a) Assume the dice are not identical. 5 $((6,2),(2,6),(5,3),(3,5),(4,4))$
b) 6 c) $5 + 6 = 11$ (since events are mutually exclusive) d) 6