2.2.4) The number of outcomes in A depends on whether or not we take into account the order in which the cards are dealt. (Normally we do not.)

If we take into account the order of the cards, we can count like this: There are 28 cards which could be the first card (4 each of ace, 2, 3, 4, 5, 6, and 7). If the first card is not a 4, there are four cards remaining that could serve as the second card. For example, if the first card is the 2 of diamonds, there are four 6's that could be the second card. On the other hand, if the first card is a 4, then there are only 3 cards that could be the second card, namely, the three remaining 4's.

Therefore we have a total of 24 times 4 plus 4 times 3 = 108 possible pairs whose sum is 8, taking order into account.

If we do not take order into account, there will be exactly half as many outcomes possible, as each outcome is counted twice in the counting given above. So if order is not taken into account, there will be 54 outcomes in A'

2.2.10 a) $S = \{(1,1),(1,2),(1,4),(2,1),(2,2),(2,4),(4,1),(4,2),(4,4)\}$

2.2.10 b) $\{2,3,4,5,6,8\}$

2.2.22 a) $F \cap R \cap V = \{E\}$

2.2.22 b) $F^C \cap R \cap V^C = \{S,T\}$

2.2.22 a) $F \cap R^C \cap V = \{A,I\}$

2.3.2) The probability that A or B but not both occur is $P(A \cup B) - P(A \cap B)$ (look at a Venn diagram): also $P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0.4 + 0.5 - 0.1 = 0.8$, so the probability that A or B but not both will occur is 0.8 - 0.1 = 0.7

2.3.10) Let A = "The number is divisible by 2" and B = "The number is divisible by 3". Then
$P(A \cup B) = P(A) + P(B) - P(A \cap B) = frac12 + \frac{1}{3} - \frac{1}{6} = \frac{2}{3}$

2.3.16) Let A = "The sum is 6" and B = "The number showing on one die is twice the number showing on the other"
$P(A \cap B^C) = \frac{1}{12}$