Problem 7 Midterm Ismod Perez

1. Probability of getting a pair:

Prob. of first card being card: 1
Prob. of second card matching: 3/51
Prob. of third card differ from first two: 48/50
Prob. of fourth card being differ from first three: 44/49
6 possible sequences (A, A, B, C)
$P(1) = 6 \times (1 \times 3/51 \times 48/50 \times 44/49) \times 100 = 30.42\%$

2 Probability of getting 2 pairs:

Prob of first card being card: 1
Prob of second card matching first: 3/51
Prob of third card being differ from the first two: 48/50
Prob of forth card being match with third: 3/49
3 possible sequences (A, A, B, B)
$P(2) = 3(1 \times 3/51 \times 48/50 \times 3/49) = 1.037\%$

3. Probability of getting 3 of a kind:

Prob of first card being card: 1
Prob of second card matching first: 3/51
Prob of third card matching second: 2/50
Prob of being differ: 48/49
4 possible sequences (A, A, A, B)
$P(3) = 4(1 \times 3/51 \times 2/50 \times 48/49) = 0.92\%$

Probability of getting 4 of a kind

Prob of getting 4 of a kind : 13/270725 = 0.0048%

Comparing to computer output :

	Math Probability	Computer Probability
1 pair	30.42 %	30.4071%
2 pair	1.037%	1.0385%
3 of a kind	0.97%	0.9818%
4 of a kind	0.0048%	0.0055%

Pretty close to simulated results.