1.1

$$P(V \cup M) = P(V) + P(M) - P(V \cap M) = 0.5 + 0.4 - 0.25 = 0.65$$

1.2

$$P(\overline{V}, \overline{M}) = 1 - P(V \cup M) = 0.35$$

1.3

$$P(V, \overline{M}) = P(V) - P(V \cap M) = 0.5 - 0.25 = 0.25$$

2. Done with replacement as mentioned in class

RRR	BBB	GGG
RRG	BBG	GGR
RRB	BBR	GGB
RGR	BGR	GRB
RGB	BGB	GRG
RGG	BGG	GRR
RBR	BRR	GBB
RBG	BRB	GBG
RBB	BRG	GBR

RRR	BBB	GGG	RRR
RRGx2	BBGx2	GGRx2	BBB
RRBx2	BBRx2	GGBx2	GGG
	BGRx2	GRBx2	RRGx3
RGBx2			RRBx3
RGG	BGG	GRR	RGBx6
	BRR	GBB	RGGx3
			RBBx3
RBB			BBGx3
			BGGx3

2a.

$$P_{2red} = 3 * \left(\frac{4}{15}\frac{4}{15}\frac{6}{15}\right) + 3 * \left(\frac{4}{15}\frac{4}{15}\frac{5}{15}\right) \approx 0.156$$

2b.

$$P_{3sa} \quad = \left(\frac{4}{15}\frac{4}{15}\frac{4}{15}\right) + \left(\frac{5}{15}\frac{5}{15}\frac{5}{15}\right) + \left(\frac{6}{15}\frac{6}{15}\frac{6}{15}\right) \approx 0.12$$

2c.

$$P_{3colors} = 6 * \left(\frac{4}{15}\frac{5}{15}\frac{6}{15}\right) \approx 0.213$$

3.

3 strikes	4 strikes	2 strike
LLL	LLLL	LL
LLR	LLLR	LR
LRL	LLRL	RL
LRR	LLRR	RR
RRR	LRLL	
RRL	LRLR	
RLR	LRRL	
RLL	LRRR	
	RLLL	
	RLLR	
	RLRL	
	RLRR	
	RRLL	
	RRLR	
	RRRL	
	RRRR	

3 strikes	4 strikes	2 strike
LLLx1 3step	LLLLx1 4s	LL
LLRx3 1step	LLRLx4 2s	LR
LRRx3 1	LLRRx6 0s	RL
RRRx1 3	RRLRx4 2s	RR
	RRRRx1 4s	
N=strikes		
K=steps		
from orgigin		

3a.

$$P_{1Rafter3} = \frac{3}{8} = 0.375$$

$$P_{2Rafter3} = \frac{0}{8} = 0$$

$$P_{3Rafter3} = \frac{1}{8} = 0.125$$

3b.

$$p_{1Rafter4} = 0$$
$$P_{2Rafter4} = \frac{4}{16} = 0.25$$
$$P_{3Rafter} = 0$$
$$P_{4Rafter4} = \frac{1}{16} = 0.0625$$

3b.

$$C_{nk} = \frac{(n+k-1)!}{k!\,(n-k)!}$$
$$C_{3,1} = \frac{3!}{2!} = 3$$
$$C_{3,3} = \frac{3!}{3!} = 1$$
$$C_{4,0} = \frac{5!}{0!\,4!} = 5$$
$$C_{4,4} = \frac{5!}{4!} = 5$$