

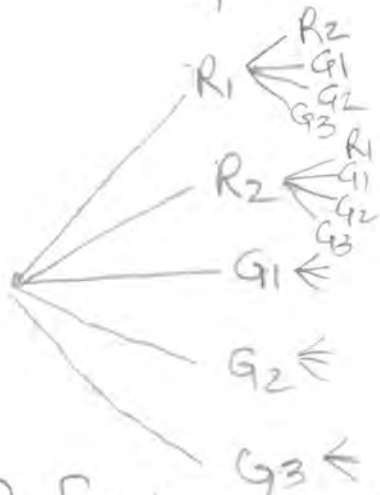
Exam 2 Part IV Probability

1a.



$$S = \{RH, RT, GH, GT, BH, BT, YH, YT\}$$

b.



Since this is a sample, the outcome $R_1 R_2$ is the same as $R_2 R_1$, so there are $C(5, 2) = 10$ outcomes

$$S = \{R_1 R_2, R_1 G_1, R_1 G_2, R_1 G_3, R_2 G_1, R_2 G_2, R_2 G_3, G_1 G_2, G_1 G_3, G_2 G_3\}$$

2. $S = \{A, B, C, D\}$. $n(S) = 4$ so $2^4 = 16$ subsets (events)
 $\emptyset, \{A\}, \{B\}, \{C\}, \{D\}, \{A, B\}, \{A, C\}, \{A, D\}, \{B, C\}, \{B, D\}, \{C, D\}, \{A, B, C\}, \{A, B, D\}, \{B, C, D\}, \{A, C, D\}, \{A, B, C, D\}$.
 4 simple events (only one outcome)

3. If E and F are mutually exclusive, $E \cap F = \emptyset$

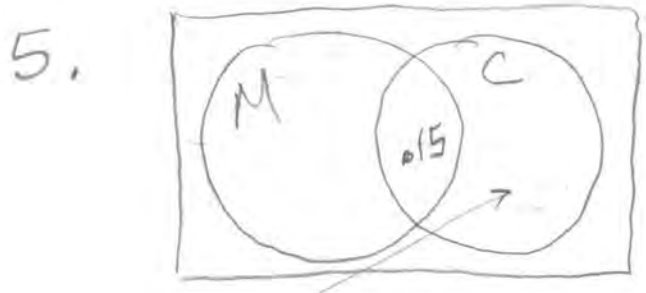


$1 - 0.5 - 0.2 = 0.3$. Shade $E^c \cup F$
 $\Rightarrow P(E^c \cup F) = 0.5$

4.

	1-1	2-1	3-1	4-1	5-1	6-1	
	1-2	2-2	3-2	4-2	5-2	6-2	
F	1-3	2-3	3-3	4-3	5-3	6-3	E
	1-4	2-4	3-4	4-4	5-4	6-4	
	1-5	2-5	3-5	4-5	5-5	6-5	
	1-6	2-6	3-6	4-6	5-6	6-6	

$E = \{x \mid x \text{ is the red die shows a } 3\}$, $P(E) = 6/36$
 $F = \{x \mid x \text{ is the sum is less than } 5\}$, $P(F) = 6/36$
 $P(E \cup F) = P(E) + P(F) - P(E \cap F)$
 $= 6/36 + 6/36 - 1/36 = 11/36$



$P(M) = .55$, $P(C) = .4$
 $P(M \cup C) = .8$
 $P(M \cup C) = P(M) + P(C) - P(M \cap C)$
 $.8 = .55 + .4 - P(M \cap C)$
 $\Rightarrow P(M \cap C) = .15$

$P(M^c \cap C) = .4 - .15 = .25$

6. Total slices = $1 + 4 + 9 + 6 + 2 = 22$, Prob = rel. freq

# pieces on slice	3	4	5	6	7
Prob	$1/22$	$4/22$	$9/22$	$6/22$	$2/22$

$P(\text{more than } 5) = 8/22$

7. Let $x =$ weight of a tomato in ounces

Event	Prob
$x < 4$	0.10
$4 \leq x \leq 8$	0.20
$8 < x \leq 12$	0.55
$x > 12$	0.15

total 0.3
 $\leftarrow 1, 1, 2, .15$