1-

(a) $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$

(b) $\frac{8!}{3! \cdot 3! \cdot 2!} = \frac{8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2 \cdot 3 \cdot 2 \cdot 2} = 560$

(c) $\binom{5}{2} \cdot \binom{3}{2} \cdot \binom{3}{1} = 90$

2-

(a) $\frac{2}{3} \cdot \frac{2}{5} = \frac{4}{15}$ $\quad \frac{1}{3} \cdot \frac{6^2}{9} = \frac{2}{9}$

$P(F) = \frac{4}{15} + \frac{2}{9} = \frac{22}{45}$

(b) $\frac{2}{3} \cdot \frac{2}{5} = \frac{4}{15} = P(N)$

$P(N|F) \stackrel{?}{=} P(N)$

$\frac{12}{22} \neq \frac{22}{45}$ dependent

$P(N|F) = \frac{P(N \cap F)}{P(F)} = \frac{\frac{4}{15}}{\frac{22}{45}} = \frac{12}{22}$

(c) $\dfrac{\frac{4}{12}}{\frac{22}{45}} = \dfrac{12}{22} = \dfrac{6}{11}$

3-

(a)	HHHH	1/16	0
	HHHT	1/16	1
	HHTH	1/16	1
	HTHH	1/16	1
	THHH	1/16	1
	HHTT	1/16	2
	HTHT	1/16	2
	HTTH	1/16	2
	THHT	1/16	2
	THTH	1/16	2
	TTHH	1/16	2
	HTTT	1/16	3
	THTT	1/16	3
	TTHT	1/16	3
	TTTH	1/16	3
	TTTT	1/16	4

b) $= f(x) = \dfrac{\binom{4}{x}}{16}$

$x \in \{0,1,2,3,4\}$

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4-

(a)

RR	2/9	2
GG	1/15	0
BB	1/45	0
RG	1/6	1
RB	1/9	1
GR	1/6	1
GB	1/15	0
BR	1/9	1
BG	1/15	0

$\frac{5}{10} \cdot \frac{4}{9} = \frac{2}{9}$

$\frac{3}{10} \cdot \frac{2}{9} = \frac{1}{15}$

$\frac{2}{10} \cdot \frac{1}{9} = \frac{1}{45}$

$\frac{5}{10} \cdot \frac{3}{9} = \frac{1}{6}$

$\frac{5}{10} \cdot \frac{2}{9} = \frac{1}{9}$

$\frac{3}{10} \cdot \frac{5}{9} = \frac{1}{6}$

$\frac{3}{10} \cdot \frac{2}{9} = \frac{1}{15}$

$\frac{2}{10} \cdot \frac{5}{9} = \frac{1}{9}$

$\frac{2}{10} \cdot \frac{3}{9} = \frac{1}{15}$

$g(0) = \frac{2}{9} \quad g(1) = \frac{5}{9}$

$g(2) = \frac{2}{9}$

$F(0) = \frac{2}{9}$

$F(1) = \frac{7}{9}$

$F(2) = 1$