#1

$$n(F \cap M) = n(F) + n(M) - n(F \cup M)$$
$$= 130 + 121 - 190$$
$$= 251 - 190 = 61$$

#2a

H, 6 choices, 5 choices

$$1 * 6 * 5$$

30

#2b

3 choices, 4 choices, NOT vowel, 3 choices

vowel ___ ___ or ___ vowel ___ or ___ ___ vowel

I or O or Y

$$3*4*3 + 4*3*3 + 4*3*3$$
$$= 108$$

#3

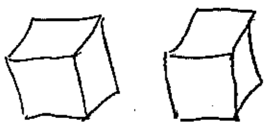
$$P(1r \text{ and } 1g) = \frac{\overset{1r}{C(41,1)}\ \overset{1g}{C(22,1)}}{C(63,2)}$$

$$= \frac{902}{1953} \approx 0.4619$$

#4 $C(8,2) = 28$

#5 $$P(E \cup F) = P(E) + P(F) - P(E \cap F)$$
$$= 4/52 + 13/52 - 1/52$$
$$= 16/52$$
$$\approx 0.3077$$

#6 $P(\text{sum} < 9 \mid r \text{ shows } 6 \text{ or } g \text{ shows } 6)$



(r, g)

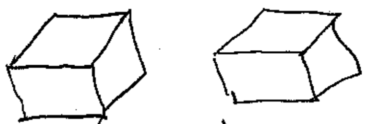
$\underline{(6,1)}$, $\underline{(6,2)}$, (6,3), (6,4), (6,5),
(6,6)
$\underline{(1,6)}$, $\underline{(2,6)}$, (3,6), (4,6), (5,6)

$$= \frac{P(\text{sum} < 9 \cap r \text{ shows } 6 \text{ or } g \text{ shows } 6)}{P(r \text{ shows } 6 \text{ or } g \text{ shows } 6)}$$

$$= \frac{4/36}{11/36} = 4/11$$

#7a $P(\text{B.A.} \mid \text{female}) = \dfrac{159}{376}$

#7b $P(\text{female and B.B.A.}) = \dfrac{194}{856}$



(r, g)

#8 $P(E) = 6/36$ $\qquad$ $P(F) = 3/36$

(5,1), (5,2), (5,3), (5,4), $\boxed{(5,5)}$, (5,6)

(4,6), (5,5), (6,4)

$P(E \cap F) = 1/36$

$P(E \cap F) \stackrel{?}{=} P(E)P(F)$

$1/36 \stackrel{?}{=} 1/6 * 1/12$

No. Not independent

#9

$P(\text{at least 1 defective}) = 1 - P(\text{no defectives})$

$= 1 - \dfrac{C(10,0)\,C(90,6)}{C(100,6)}$