1) (a) A = Possible names with 2 letters

$n(A) = \frac{26!}{(26-2)!} = \cancel{650} \quad 26^2 = 676$ 2

B = Possible names with 2 different letters/numbers

$n(B) = \cancel{36} \quad \frac{36!}{(36-2)!} = 1260$ 2

(b) C = Possible names with 4 characters.

$n(C) = 36^4 = 1679616$ 2

(c) $P(\text{already taken}) = \frac{97\,786}{1679616} = 5.8\%$ 1.5

2) (a) The sample space is a combination of the 14 people with no repetition/w/o replacement.

A = sampling a committee

$n(A) = \frac{(14+4-1)!}{4!(14-1)!} = 2380$

$P(A) = \frac{1}{2380}$ 2.5

(b) B = Balanced committee of 2 men and 2 women

$n(B) = \frac{(6+2-1)!}{2!(6-1)!} + \frac{(8+2-1)!}{2!(8-1)!}$

$= \frac{5040}{240} + \frac{362880}{10080}$

$= 57$

$P(B) = \frac{57}{2380} = 0.024$

$P(B) = \frac{\binom{8}{2}\binom{6}{2}}{\binom{14}{4}} = \frac{8!}{2!} \cdot \frac{6!}{2!} \cdot \frac{4!}{14!}$

$= 0.0020$

2

(c) C = At least 1 woman

$$P(C) = \frac{\binom{8}{1}\binom{13}{3}}{\binom{14}{2}} = \frac{8}{1}\cdot\frac{13!}{3!}\cdot\frac{2!}{14!}$$

$$= 0.19$$

3) (a) $\frac{(9+27+15)!}{(9+27+15-3)!} = 124950$

2

(b) $\cancel{\frac{27!}{(27-1)!} +}\ \frac{9!}{(9-1)!} + \frac{27!}{(27-1)!} + \frac{49!}{(49-1)!} = 85$

1

(c) $\frac{(27+3-1)!}{3!\,(27-1)!} = \frac{29!}{3!\cdot 26!} = 3654$

(d) $\frac{9!}{8!} + \frac{27!}{26!} + \frac{15!}{14!} = 51$

4) (a)

15/40

(b)(i)