

STATS 1 REVISION ARRANGEMENTS (FROM OCR PAPERS)

1) i) a) $\begin{array}{|c|c|c|} \hline 3 & 2 & 1 \\ \hline \end{array}$ = 6

b) $\begin{array}{|c|c|c|} \hline 3 & 3 & 3 \\ \hline \end{array}$ = $3^3 = 27$

c) If each digit can be included at most twice

Consider number of unrestricted ways - number with 3 of a kind

$$27 - 3 = 24$$

$$\begin{pmatrix} 111 \\ 222 \\ 333 \end{pmatrix}$$

1) ii) Since only 3 digits available, one must always occur twice

1, 1, 2, 3 or 1, 2, 2, 3 or 1, 2, 3, 3

Arrangements of 1, 1, 2, 3 = $\frac{4!}{2!} = 12$

Ditto for 1, 2, 2, 3 = 12

Ditto for 1, 2, 3, 3 = 12

Can also have 2 pairs of 2

1, 1, 2, 2, 2, 2, 3, 3, 1, 1, 3, 3

Arrangements of 1, 1, 2, 2 = $\frac{4!}{2!2!} = 6$

Ditto for 2, 2, 3, 3 = 6

Ditto for 1, 1, 3, 3 = 6

Total number of arrangements = $12 + 12 + 12 + 6 + 6 + 6 = 54$