

Pg: 2

- 9) Nine cards are numbered 1, 2, 2, 3, 3, 4, 6, 6, 6.
 (i) All nine cards are placed in a line, making a 9-digit number. Find how many different 9-digit numbers can be made in this way.

(a) if the even digits are all together.

1, 2, 2, 3, 3, 4, 6, 6, 6
2, 2, 4, 6, 6, 6

$$\frac{4! \times 6!}{2! \times 2! \times 3!} = 720.$$

(b) if the first and last digits are both odd.

1, 3, 3

$${}^3C_2 \times \frac{7!}{2! \times 3!} = 1260$$

- (ii) Three of the nine cards are chosen & placed in a line, making a 3-digit number. Find how many different numbers can be made in this way.

(a) if there are no repeated digits.

$$\Rightarrow 5 \times 4 \times 3 = 60$$

5 choi 4 ch 3 ch

$${}_5P_3$$