FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

N5: Counting problems

Solve problems using systematic listing and the product rule

20 marks · 25 minutes · Non-calculator

1) A code is 3 letters (A to Z) followed by 2 digits (0 to 9). The first letter must be a vowel and the two digits must be different. How many codes are possible?

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[Question 1: 3 marks]

2) A restaurant offers 4 starters, 5 mains and 3 desserts. A customer has either three courses, or two courses one of which must be a main. How many different meals are possible?

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[Question 2: 4 marks]

3) How many four-digit even numbers can be made from the digits 1 to 9 if no digit is repeated?

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[Question 3: 3 marks]

4) A pair is chosen from 6 boys and 4 girls. It must have one boy and one girl. How many pairs are possible?

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[Question 4: 2 marks]

5) A lock has 3 dials, each from 0 to 9. Ali remembers that the three digits are all different and add up to 5. How many codes could it be?

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[Question 5: 3 marks]

6) Jo has some shirts, 4 pairs of trousers and 3 pairs of shoes. She can make 84 different outfits. How many shirts does she have?

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[Question 6: 2 marks]

7) 8 people meet and each person shakes hands once with every other person. How many handshakes are there?

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[Question 7: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	304 200	$5 \times 26 \times 26$ (P1); 10×9 (P1); A1.
2	95	3 courses $4 \times 5 \times 3 = 60$ (P1); starter+main 20 (P1); main+dessert 15 (P1); 95 (A1).
3	1344	Last digit: 4 choices (P1); $8 \times 7 \times 6$ (P1); A1.
4	24	6×4 (P1); A1.
5	12	Sets $\{0,1,4\}$ and $\{0,2,3\}$ (P1, P1); $2 \times 6 = 12$ (A1).
6	7	$84 \div 12$ (P1); A1.
7	28	8×7 (P1); divide by 2 (P1); 28 (A1).