FOUNDATION & HIGHER

HIGHER EXTENDS

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

N5: Systematic listing

Listing strategies and the product rule for counting

20 marks · 25 minutes · Non-calculator

1) A café offers 3 starters, 4 main courses and 2 desserts. How many different three-course meals can be chosen?

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[Question 1: 1 marks]

2) List all the two-digit numbers that can be made from the digits 1, 5 and 8. Each digit may be used at most once in a number.

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[Question 2: 2 marks]

3) A code is made of 4 digits from 0 to 9

(a) How many different codes are possible?

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(1)

(b) How many codes are possible if no digit may be repeated?

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(2)

[Question 3: 3 marks]

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4) A number plate has 2 letters (A to Z) followed by 3 digits (0 to 9). How many different number plates are possible?

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[Question 4: 2 marks]

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5) In how many different orders can the five letters of the word MATHS be arranged?

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[Question 5: 1 marks]

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6) Kim chooses 2 different toppings from a list of 5. The order does not matter. How many different pairs can she choose?

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[Question 6: 2 marks]

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7) Three-digit numbers are made using the digits 2, 3, 4, 5 and 6, with no digit repeated. How many of these numbers are even?

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[Question 7: 2 marks]

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8) A password is one letter (A to Z) followed by two digits (0 to 9). How many passwords are possible?

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[Question 8: 1 marks]

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9) How many four-digit whole numbers (from 1000 to 9999) are odd?

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[Question 9: 2 marks]

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10) A captain and a vice-captain are chosen from 8 players. How many different ways can this be done?

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[Question 10: 2 marks]

11) Ali has 5 shirts and 3 pairs of trousers. He wears one shirt, one pair of trousers and either one of his 2 hats or no hat. How many different outfits are possible?

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[Question 11: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	24	B1.
2	15, 18, 51, 58, 81, 85	B2 (B1 for 4 or 5 correct).
3	(a) 10 000 (b) 5040	(a) B1. (b) $10 \times 9 \times 8 \times 7$ (M1); A1.
4	676 000	$26 \times 26 \times 10 \times 10 \times 10$ (M1); A1.
5	120	B1.
6	10	Systematic list or $\frac{5 \times 4}{2}$ (M1); A1.
7	36	$4 \times 3 \times 3$ (M1); A1.
8	2600	B1.
9	4500	$9 \times 10 \times 10 \times 5$ (M1); A1.
10	56	8×7 (M1); A1.
11	45	$5 \times 3 \times 3$ (M1); A1.