Systematic Listing and the Product Rule

GCSE Mathematics • **Foundation Tier** • Grades 3–6 • Non-calculator

Name: _____ Class: _____ Total: _____ / 55

Show all your working. Marks are given for correct method as well as the final answer.

1. List all the two-digit numbers that can be made using the digits 3, 5 and 8, with no digit repeated. **[2 marks]**

Answer: _____

2. Work out how many two-digit numbers can be made from 3, 5 and 8 if digits MAY be repeated. **[2 marks]**

Answer: _____

3. A menu has 4 starters and 6 mains. Work out how many different two-course meals are possible. **[2 marks]**

Answer: _____

4. A menu has 4 starters, 6 mains and 3 puddings. Work out how many three-course meals are possible. **[2 marks]**

Answer: _____

5. A password is 3 letters followed by 2 digits. Letters and digits may repeat. Work out how many are possible. **[3 marks]**

Answer: _____

6. List all the ways of arranging the letters A, B and C. **[2 marks]**

Answer: _____

7. Work out how many ways 5 different books can be put in a row. **[2 marks]**

Answer: _____

8. Work out how many ways 4 people can sit on 4 chairs. **[2 marks]**

Answer: _____

9. Complete the sample space diagram for the TOTAL when a three-sided spinner $(1, 2, 3)$ and a four-sided spinner $(1, 2, 3, 4)$ are spun. **[3 marks]**

+	**1**	**2**	**3**	**4**
1				
2				
3				

Answer: _____

10. Using that sample space, work out the probability the total is 5. **[2 marks]**

+	**1**	**2**	**3**	**4**
1				
2				
3				

Answer: _____

11. Using that sample space, work out the probability the total is more than 5. **[2 marks]**

+	**1**	**2**	**3**	**4**
1				
2				
3				

Answer: _____

12. Two ordinary dice are thrown. Work out how many outcomes there are. **[2 marks]**

Answer: _____

13. Two ordinary dice are thrown. Work out the probability of a double. **[3 marks]**

Answer: _____

14. A coin is flipped three times. List all the outcomes. **[3 marks]**

Answer: _____

15. A coin is flipped three times. Work out the probability of exactly two heads. **[3 marks]**

Answer: _____

16. A three-digit code uses digits 1 to 9 with no repeats. Work out how many codes are possible. **[3 marks]**

Answer: _____

17. A car number plate is 2 letters then 3 digits, repeats allowed. Work out how many are possible. **[3 marks]**

Answer: _____

18. Work out how many even three-digit numbers can be made from $1, 2, 3, 4$ with no repeats. **[4 marks]**

Answer: _____

19. A cafe offers 3 breads, 5 fillings and 2 sauces.

(a) Work out how many different sandwiches are possible. **[2 marks]**

(b) One filling sells out. Work out how many are possible now. **[2 marks]**

Answer: _____

20. A four-digit PIN uses digits 0 to 9.

(a) Work out how many PINs are possible if repeats are allowed. **[2 marks]**

(b) Work out how many start with an odd digit and have no repeats. **[4 marks]**

Answer: _____

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