# Product Rule for Counting

Grade 6 topic · Higher tier · Edexcel and AQA

**How to use this pack**
20 questions that get harder as you go. Questions 1–15 (57 marks) build up to the harder Grade 8–9 style questions at the end; aim to complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 86 marks.

## Warm-up

**1** A café has 4 starters, 7 mains and 3 desserts. How many different three-course meals are possible? **[3 marks]**

**Answer** _____

**2** A PIN has 4 digits, each from 0 to 9. How many different PINs are there? **[3 marks]**

**Answer** _____

**3** A shop sells 7 shirts, 6 trousers and 4 pairs of shoes. How many different outfits are possible? **[3 marks]**

**Answer** _____

**4** A coin is tossed 5 times. How many different sequences of heads and tails are possible? **[3 marks]**

**Answer** _____

**5** A password is 2 letters followed by 5 digits. How many passwords are possible? **[3 marks]**

**Answer** _____

## Core

**6** How many different 3-letter arrangements can be made from the letters A, B, C, D, E using each letter once? **[4 marks]**

**Answer** _____

**7** How many 4-digit numbers can be made from the digits 1 to 9 if no digit is repeated? **[4 marks]**

**Answer** _____

**8** There are 8 runners in a race. How many different ways can first, second and third place be filled? **[4 marks]**

**Answer** _____

**9** How many ways can 5 people stand in a line? **[4 marks]**

**Answer** _____

**10** A code has 5 digits, each from 1 to 6, and no digit repeated. How many codes? **[4 marks]**

**Answer** _____

## Stretch

**11** How many 3-digit numbers can be made from the digits 1 to 5 with repetition allowed? **[4 marks]**

**Answer** _____

**12** How many 3-digit even numbers can be made from the digits 1, 2, 3, 4, 5 (repetition allowed)? **[5 marks]**

**Answer** _____

**13** How many 3-digit numbers can be made from 1, 2, 3, 4, 5 with no repeats that are odd? **[5 marks]**

**Answer** _____

**14** A licence plate has 2 letters then 3 digits. How many plates are possible? (26 letters, digits 0–9) **[4 marks]**

**Answer** _____

**15** How many different 4-letter arrangements of the letters in the word MATH are there? **[4 marks]**

**Answer** _____

## Challenge

**16** How many ways can 3 boys and 2 girls stand in a line if the girls must stand together? **[6 marks]**

**Answer** _____

**17** How many 4-digit numbers can be made from the digits 0 to 9 if the first digit cannot be 0 and repeats are allowed? **[5 marks]**

**Answer** _____

**18** How many 4-digit numbers can be made from 1, 2, 3, 4, 5, 6 if no digit is repeated and the number is divisible by 5? **[6 marks]**

**Answer** _____

**19** How many different 5-letter arrangements can be made from the letters in the word LEVEL? **[6 marks]**

**Answer** _____

**20** A committee of 3 is chosen from 8 people. How many different committees are there? **[6 marks]**

**Answer** _____