

# Summer maths puzzle pack for A Level Maths

A Level Math Revision · A Level Maths (Year 12 and Year 13) · Student sheet

Name \_\_\_\_\_

Class \_\_\_\_\_

Date \_\_\_\_\_

No calculator needed.

## Starter (5 minutes)

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1. Find the next term: 1, 1, 2, 3, 5, 8, ...
2. A brick weighs 1 kg plus half a brick. How much does a brick weigh?
3. Work out  $1 + 3 + 5 + \dots + 99$ .

## Main activity (35 minutes)

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### Task A: Number puzzles

Look for a pattern before you calculate.

- a. What is the last digit of  $7^{100}$ ?
- b. How many zeros are there at the end of  $25!$  ( $25 \times 24 \times \dots \times 1$ )?
- c. Find every positive whole number  $n$  for which  $n^2 - 1$  is prime.

### Task B: Logic puzzles

Write an equation, or try and improve.

- a. Ana is 3 times as old as her brother. In 5 years she will be twice as old as him. How old are they now?
- b. A farm has chickens and goats: 20 heads and 56 legs. How many goats are there?
- c. Three consecutive whole numbers add to 252. Find the largest.

### Task C: Counting and chance

Count carefully: list a few cases first.

- a. Ten friends each shake hands once with every other friend. How many handshakes is that?
- b. Two fair dice are rolled. Find the probability that they show the same number.
- c. How many different arrangements are there of the letters of LEVEL?
- d. How many squares of any size are there on an  $8 \times 8$  chessboard?

### Extension

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1. Prove that the sum of any three consecutive integers is a multiple of 3.