

Maths about me: a first-lesson icebreaker for A Level Maths

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

Name _____

Class _____

Date _____

The starter is non-calculator. A calculator is useful for task A.

Starter (5 minutes)

1. I am a positive integer and my square is 6 more than me. Who am I?
2. I am $1 + 2 + 3 + \dots + 20$. Who am I?
3. I am $\log_2 32 - \log_3 9$. Who am I?
4. I am the coefficient of x^2 in $(1 + x)^6$. Who am I?

Main activity (35 minutes)

Task A: Maths about me

Work through Sam's made-up numbers first. Then write the same facts about your own numbers on paper.

- a. Sam was born on day 18 of month 12 in 2008. Write 12 and 2008 as products of prime factors, and find their HCF and LCM.
- b. Write 2008 in binary.
- c. How many terms of the arithmetic sequence 12, 18, 24, ... are less than 2008, and what is their sum?

Task B: 'Who am I?' in pairs

Solve these with a partner. Then each write a riddle of your own, on a topic from last year, with exactly one answer and swap.

- a. I am the only positive integer n with $2^n = n^2 + 7$. Who am I?
- b. Find every two-digit number that equals the sum of its digits plus the product of its digits.
- c. I am the sum to infinity of a geometric series with first term 6 whose first two terms add to 10. Who am I?

Task C: Four 4s

Use exactly four 4s to make each target. Allowed: $+$, $-$, $\times$, $\div$, brackets, powers, $\sqrt{\quad}$ and $!$ ($4! = 24$). You may join two 4s to make 44. Other answers are possible.

- a. Make 0 and 24.
- b. Make 19.
- c. Make 1024.
- d. Make 11 using $\sqrt{\quad}$.

Extension

1. Prove that the difference between a two-digit number and the number with its digits reversed is always a multiple of 9.
2. Prove that $n^3 - n$ is a multiple of 6 for every integer n .