

Summer maths puzzle pack for A Level Maths: answers

A Level Math Revision · A Level Maths (Year 12 and Year 13) · Teacher answers and notes

No calculator needed.

Teacher notes

- Take-home: print the student sheet for the last lesson before the summer and set it as optional holiday puzzles. Share the answers PDF in the first week back, or put it up after a week so families can check.
- Do the starter together in class so everyone knows how to start a puzzle: draw it, try a small case, look for a pattern.
- Good bridging work between Year 12 and Year 13, or for students about to start the course.

Starter

1. **13**

- Add the two before: $5 + 8$

2. **2 kg**

- Half a brick weighs 1 kg.

3. **2500**

- 50 odd numbers: $50^2 = 2500$

Task A: Number puzzles

a. **1**

- Last digits cycle 7, 9, 3, 1.
- $100 = 4 \times 25$, so the last digit is 1.

b. **6**

- Each zero needs a 5 (2s are plentiful).
- Multiples of 5 up to 25: 5 of them, and 25 gives an extra 5: 6

c. **$n = 2$ only**

- $n^2 - 1 = (n - 1)(n + 1)$.
- For a prime, the smaller factor must be 1, so $n = 2$ (giving 3).

Task B: Logic puzzles

a. **Ana 15, her brother 5**

- $a = 3b$ and $a + 5 = 2(b + 5)$
- $b = 5$

b. **8 goats**

- $c + g = 20$ and $2c + 4g = 56$
- $2g = 16$

c. **85**

- $(n - 1) + n + (n + 1) = 3n = 252$, so $n = 84$

Task C: Counting and chance

a. **45**

- ${}^{10}C_2 = 45$

b. **1/6**

- 6 doubles out of 36

c. **30**

- $5!/(2! \times 2!) = 120/4 = 30$

d. **204**

- $1^2 + 2^2 + \dots + 8^2 = 204$

Extension

1. **$(n - 1) + n + (n + 1) = 3n$**

- Call the middle integer n .
- The sum is $3n$, which is a multiple of 3 for every integer n .

Every question is original and every answer was recomputed by computer before publishing.