

Summer maths puzzle pack for IB Maths: answers

IB Math Revision · IB Maths SL and HL (AA and AI) · 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.
- The counting puzzles preview combinations; the extension is a first proof for students new to 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. **$1 + 3 + \dots + (2n - 1) = n^2$**

- It is an arithmetic series with first term 1, last term $2n - 1$ and n terms.
- $S = n/2 \times (1 + 2n - 1) = n^2$. (HL: or by induction.)

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