Children’s Day maths puzzle challenge for CBSE Class 9 and 10: Beyond school: answers

CBSE Math Revision · Beyond school: for adults and maths fans · 14 November · Teacher answers and notes

No calculator needed. Every answer works out exactly.

Teacher notes

- A stretch set for anyone past school maths: adults, maths clubs and keen sixth-formers. Competition style, no calculator, every answer exact.

Starter

1. **5050**
   - 50 pairs adding to 101: 5050
2. **1**
   - The last digits of 3^n run 3, 9, 7, 1 (period 4).
   - 100 is a multiple of 4, so the last digit is 1.
3. **9**
   - $100 = 2^2 \times 5^2$: $(2 + 1)(2 + 1) = 9$
4. **13**
   - 14, 21, ..., 98: that is $98/7 - 1 = 13$

Task A: Round 1: puzzles for 14 November

a. **78**
- Choose 2 of the 13 gaps between the sweets: ${}^{13}C_2 = 78$

b. **192**
- 14 divisors means 2^{13} or p^6q.
- The smallest is $2^6 \times 3 = 192$.

c. **2**
- Factors of 5 come from 5 and 10: two of them.

Task B: Round 2: chance

a. **7/13**
- $7 \times 7 = 49$ mixed pairs out of ${}^{14}C_2 = 91$.
- $49/91 = 7/13$

b. **7/3**
- $14 \times 1/6 = 7/3$

c. **91/216**
- $1 - (5/6)^3 = 1 - 125/216 = 91/216$

Extension

1. **22**
   - List by the largest part, or use the generating function $(1 + x)(1 + x^2)(1 + x^3)...$; the coefficient of x^{14} is 22.

Every question is original and every answer was checked before publishing.