Age 11+ Level ★
Worksheet 1 - Solutions

1. No Matter

My answer will always be a multiple of 7
nrich.maths.org/2532/solution

2. Nine in a Line

The largest number is 227
nrich.maths.org/5752/solution

3. Adding and Multiplying

The answer would have been 3165
nrich.maths.org/12817/solution

4. Cube Pile

A tower of all five cubes would be 50 cm tall
nrich.maths.org/11712/solution

5. 8 in a Row

The largest is 11
nrich.maths.org/12613/solution

6. Paul's Children

His sons' ages add up to 12
nrich.maths.org/11639/solution

These problems are adapted from UKMT (ukmt.org.uk) and SEAMC (seamc.asia) problems.

Age 11+ Level ★★
Worksheet 1 - Solutions

1. **Standing on the Table**
   The table is 90 cm tall
   nrich.maths.org/11717/solution

2. **Square Total**
   The smallest positive integer is 5
   nrich.maths.org/11703/solution

3. **Adding in Pairs**
   The numbers are 18, 21 and 30, so the largest is 30
   nrich.maths.org/13384/solution

4. **Multiple Magic**
   Your answer will always be a multiple of 3
   nrich.maths.org/6260/solution

5. **Building Up**
   x = 360
   nrich.maths.org/10164/solution

These problems are adapted from UKMT (ukmt.org.uk) and SEAMC (seamc.asia) problems.

Age 14+ Level ★★
Worksheet 1 - Solutions

1. Divisible Expression

$(1 + x + y)^2 - (1 - x - y)^2 = 4x + 4y = 4(x + y)$

which is divisible by 4

nrich.maths.org/6738/solution

2. Little Difference

$(x - 1)(x + 1) - x^2 = x^2 - 1 - x^2 = -1$

so $2015 \times 2017 - 2016^2 = -1$

and $2016 \times 2018 - 2017^2 = -1$

nrich.maths.org/10126/solution

3. Brian's Number

The largest integer he could have chosen is 21

nrich.maths.org/12570/solution

4. Adding to 400

The four integers are 192, 96, 64 and 48

nrich.maths.org/11678/solution

5. Order the Products

In order of size, from smallest to largest:

186×214 210×190 195×205 198×202 200×200

nrich.maths.org/13573/solution

6. Square and Cube

The number is

nrich.maths.org/10120/solution

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Age 14+ Level ★★
Worksheet 2 - Solutions

1. Cuboid Perimeters

The volume of the cuboid is $35\ cm^3$

nrich.maths.org/12780/solution

2. Relative Powers

The number is -3

nrich.maths.org/5017/solution

3. Clever Calculation

$x^2 - (x-2)(x+2) = x^2 - x^2 + 4 = 4$

so $2017^2 - 2015 \times 2019 = 4$

nrich.maths.org/13223/solution

4. Big Fibonacci

The maximum possible value of the first term is 999

nrich.maths.org/9395/solution

5. Granny's Age

Our ages add up to 100

nrich.maths.org/10158/solution

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Age 14+ Level ★★★
Worksheet 1 - Solutions

1. Choir Boys

The choir has 99 members this year
nrich.maths.org/12604/solution

2. Stolen Pension

The pensioner had £2057 before the theft
nrich.maths.org/13219/solution

3. Find the Factor

The smaller factor is 63
nrich.maths.org/13753/solution

4. Third Side

The three possible Pythagorean triples are:
7, 24, 25
21, 20, 29
35, 12, 37
so the three possible lengths for the third side are 7, 21 and 35
nrich.maths.org/12809/solution

5. Months and Years

Mary was 12 years old on her last birthday
nrich.maths.org/8678/solution

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