Creating and Manipulating Expressions

Age 14+ Level ★★★
Worksheet 1

1. Choir Boys
Two schools share a choir. Last year there were 30 more students from school B than students from school A in the choir.

This year the number of choir members has increased by 10%.
The number of members from school A has increased by 20%.
The number of members from school B has increased by 5%.

How many members does the choir have this year?

2. Stolen Pension
A thief stole $\frac{6}{11}$ of a pensioner's money and spent $\frac{6}{11}$ of the money stolen.
The thief was then caught, and the remaining money was returned to the pensioner. The remaining money was £425 less than the amount the pensioner had after being robbed.
How many pounds did the pensioner have before the theft?

3. Find the Factor
$2^{48} - 1$ is divisible by two whole numbers between 60 and 70.
Find the smaller of these.

4. Third Side
The lengths of the sides of a right-angled triangle are all integers.
The sum of the lengths of the hypotenuse and one of the other sides is 49.
What are the three possible lengths for the third side?

5. Months and Years
The product of Mary's age in years on her last birthday and her age now in complete months is 1800.
How old was Mary on her last birthday?

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