

**Age 14+ Level ★★★**
Worksheet 1**1. Jewellery Boxes**

Two boxes, P and Q, each contain 3 jewels. When a jewel worth £5000 is transferred from P to Q, the average value of the jewels in each box increases by £1000.

What is the total value of all six jewels?

2. Possible Range

The median of a set of five positive integers is one more than the mode and one less than the mean.

What is the largest possible value of the range of the five integers?

3. Very Average

In the list below, each number (from b onwards) is the mean of the two numbers before it.

$$40, a, b, c, d, 150$$

Find the value of a .

4. Changing Averages

A list of integers has a mode of 32, mean 22 and median m .
 m is one of the numbers on the list.

The smallest number on the list is 10.

If m were replaced with $m + 10$, the mean would be 24.

If m were instead replaced with $m - 8$, the median would be $m - 4$.

What is m ?

5. Pay Attention

When a speaker gave a talk, 6% of the audience slept through the whole thing.

22% of the audience stayed awake and heard the entire talk.

Of the rest of the audience, half of them heard $\frac{2}{3}$ of the talk, and half of them heard $\frac{1}{3}$ of the talk.

What was the average proportion of the talk that people heard?

These problems are adapted from UKMT (ukmt.org.uk) and WMC (competition.ac) problems.