



**Stage 3 ★**  
**Mixed Selection 3**

**1. Roman distances**

In ancient Rome they used the following units of length:

5 pedes = 1 passus, 125 passus = 1 stadium.

The atrium (courtyard) of Marcus' home was a square with each side 50 pedes long.

How many times did Marcus have to walk round his atrium to complete his daily exercise of 8 stadia? Try writing your answer in Roman numerals.

**2. Walking in the mountains**

Heidi and Peter went for a mountain walk from Obersee to Salzbau. They left Obersee at 12 noon and the sign there said that Salzbau was 2 hours and 55 minutes away.

At one o'clock they sat down for lunch under another sign which said that Salzbau was now only 1 hour and 15 minutes away.

After stopping for 15 minutes for lunch, they continued their walk at the same speed as before without any further breaks. At what time did they reach Salzbau?

**3. Thunder and lightning**

Sound travels at about 330 metres per second; light travels so fast that it arrives almost instantaneously. If you time the gap between a flash of lightning and its clap of thunder as 6 seconds, roughly how far away is the storm?

**4. Dean's mountain**

Dean runs up a mountain road at 8 km per hour. It takes him one hour to get to the top. He runs down the same mountain at 12 km per hour.

How long does it take him to run down the mountain?

*These problems are adapted from UKMT Mathematical Challenge problems ([ukmt.org.uk](http://ukmt.org.uk))*