



Stage 3 ★
Mixed Selection 2 - Solutions

1. Tummy ache

Timmy takes 24 mins ($\frac{8}{20}$ of an hour) to reach the surgery;
Tammy takes 18 minutes ($\frac{12}{40}$ of an hour);
Tommy takes 22 minutes ($\frac{33}{90}$ of an hour).
The order therefore is Tammy, Tommy, Timmy.

2. Hiking the hill

Suppose the path is x miles long. Then she takes $\frac{x}{2}$ hours to walk up the hill, and another $\frac{x}{4}$ hours to walk back down. Therefore, in $\frac{3x}{4}$ hours she walks a total distance of $2x$.

This means her average speed is $2x \div \frac{3x}{4} = \frac{8}{3}$ miles per hour.

3. Travelling by train

The train travels a total of $27 + 29 = 56$ km, adding the distances before and after Darlington.

This is all travelled at 96 km/h, so the time taken to do this is:
 $56 \text{ km} \div 96 \text{ km/h} = 35 \text{ minutes}$

There is also a 3 minute stop at Darlington, so the total time taken is $35 + 3 = 38$ mins.

Therefore Stephen arrives at Durham at 09:38.

4. Turbo tortoise

Turbo will take 3 hours to complete the 12 miles, whilst Harriet will take 1 hour 30 minutes. So Harriet should set off 1 hour 30 minutes after Turbo, that is at 9:45 am.

These problems are adapted from UKMT Mathematical Challenge problems (ukmt.org.uk)