SNAIL TRAIL

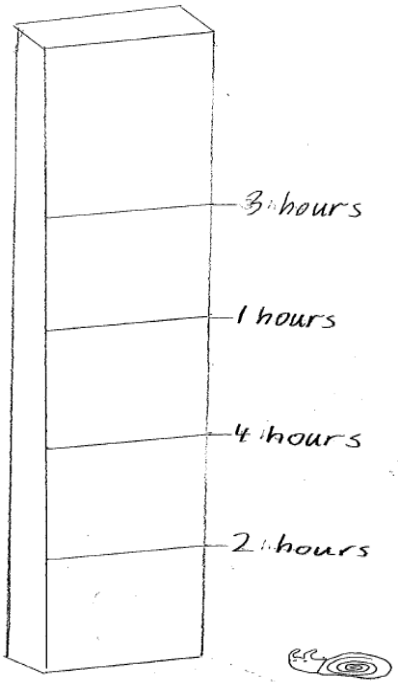
Connor Gibbins, Year 7

What the problem is about

There is a well that is 11 metres high and a snail is at the bottom of it. To climb this well, it would ascend 5 metres up the well, and after an hour, it would rest for another hour. While it is resting, it slides down 3 metres. When we are given the numbers of how high it climbs, and how far it falls, we have to figure out how many hours it takes to climb up the well.

A second snail is added to the mix. This one climbs at a different rate to the first snail. When Snail 2 climbs, it reaches 6 metres in an hour before resting. While this snail is resting, it slides down 4 metres.

The main problem we had to work out is; which snail climbs out of the well first?



What we did

Firstly, I used the block and peg given to us so I could get a visual representation of the problem.

After I did this, I drew up a table to put in the data that I collected.

Hours	Snail 1	Snail 2
-	-	-
-	-	-

Once this was completed, I started thinking of different combinations of ascending, and descending, to climb the well.

Ascend 3 metres, descend 2 **Rise 4 metres, fall 3**

Go up 8 metres, slide down 5 **Climb 7 metres, fall 4**

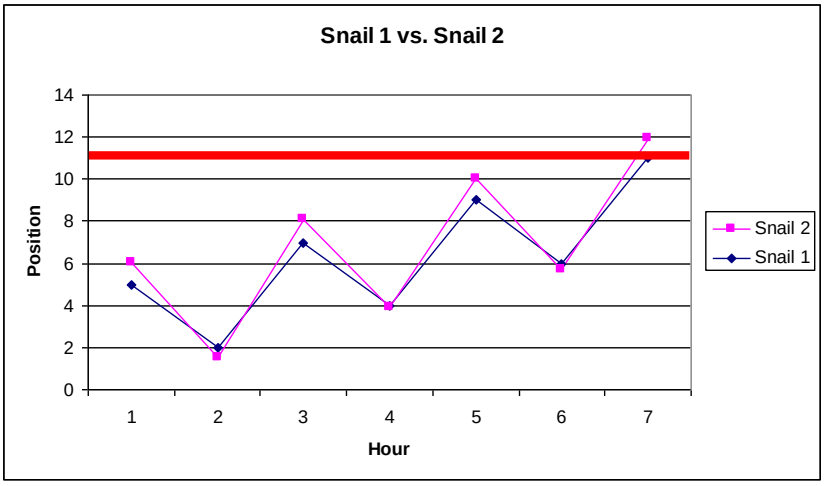
The next thing I did was look for the quickest and slowest way to climb out of the well.

On Microsoft Excel, I created graphs to show both snails' journey out of the well.

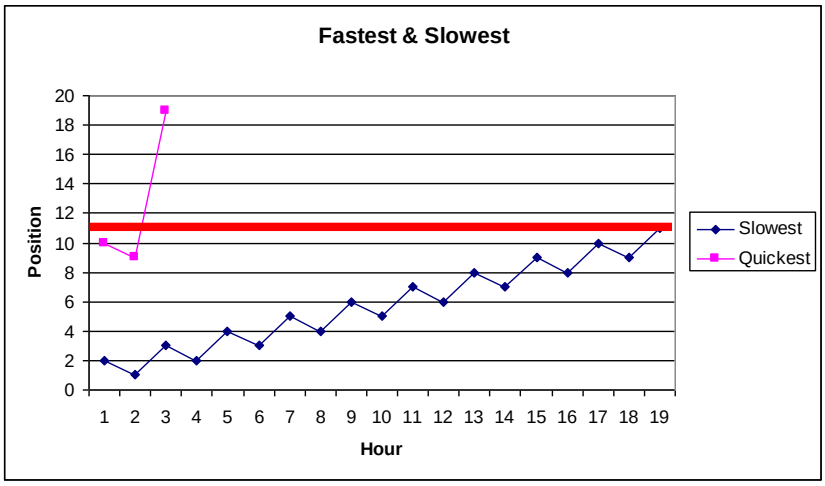
Finally, I tried to find a rule for this problem but I was unsuccessful in doing so.

What we found out

I couldn't find a definite rule to this problem because every combination (height of the well, how high the snail climbs, and how far it falls), has a different answer.



Snail 2, which climbed 6 metres, and fell 4, climbed out of the well in a time of 2 hours 50 minutes. Its opposition Snail 1, climbed out in exactly 3 hours by climbing 5 metres, and descending 3.



The fastest way to climb up an 11 metre well is by going up 10 metres, and falling down 1. This is done in 2 hours 12 minutes. The slowest is by ascending 2 metres in 1 hour, and then descending 1 metre. After 19 long hours, the snail would reach the top of the well. Some patterns with Snail 1 and Snail 2 are when they rest for an hour, once they finish resting both snails are at the same position on the well. On the graph showing the slowest way to climb the well, what you can see is it zig zags up the graph and out of the well.

Conclusion

What I enjoyed about doing this report was the amount a things that branch off the original question. I was able to expand and investigate further, the initial question of 'Which snail reaches the top of the well first?' Because I was able to use graphs and tables to give a visual representation of the problem, it made it a lot easier to type up this maths report.