

Both these puzzles can be answered once you realise how to avoid or overcome the obstacle or interruption. Here's how:

PUZZLE 1

This problem seems tricky, because the hummingbird will change directions an infinite number of times as the trains converge on each other.

If you proceed by brute force, you'll need to find the time it takes the hummingbird to fly to get to the first train, and then back to the second, and then back to the first, and keep going infinitely.

In fact, there's a story that the mathematician John Von Neumann was posed this problem, and answered it easily... by summing the infinite series!

However, there is a much easier way.

The trains take 1 minute to reach each other, since the distance between them closes at a rate of 60km per hour, or 1km per minute.

The hummingbird will be flying for exactly 1 minute, then, at a rate of 60km per hour, or 1 km per minute. So the hummingbird travels exactly 1 km!

PUZZLE 2

There is a wonderful trick to solve this problem. To see how it works, let's look at two ants just when they are about to meet. We'll imagine that one is red and one is black, so we can tell them apart.



What will the picture look like right after they meet? We know, of course: they'll bounce off of one another and head the other way.



Consider this, though. If instead, they passed through (or around) each other, how would the picture look different?



In terms of ant placement, it's the same picture. Colour both ants red again, and we'd have no idea whether the ants were bouncing off one another or passing through each other.

This means we could change the rules and know we'd get the same picture as time moves forward: the ants could be passing around each other. Or through each other - maybe they're ghost ants. In any case, we've avoided the interruptions, and we've given ourselves a much simpler problem.



There are 100 ants, and each crawls in a straight line past the other ants. It takes each one a minute to crawl the length of the edge of the side-walk, which is itself a metre long. Any that start crawling away from the wall will be off the side-walk within a minute. Any crawling toward the wall will take at most a minute to reach it, and a minute more to crawl off the side-walk.

We know, in other words, that all the ants will have crawled off the side-walk in a maximum of two minutes time.

That's it for this week. Happy puzzling!