Maths With Zombies

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19. The Containment Zone Problem - Part I

There's been a report of a zombie outbreak on the north side of the city and your unit of 600 men has been sent in to set up a containment zone while others attempt to neutralise the problem. So far the outbreak is limited to a single city block and your containment zone will consist of a one block buffer zone on all sides of the affected area. This means you will have to seal off a square consisting of a total of nine city blocks, each of which is 50 yards long and 50 yards wide. To make sure your defences hold, know you need at least two soldiers for every three yards of your perimeter. You have two choices: set up the containment zone now or wait for reinforcements. If you try to set up the containment zone and you don't have enough men to man it properly, you risk being over-run and the zombies will take over the city. However, any unnecessarily delay while you wait for reinforcements will give the zombie disease time to spread, making it harder to contain. You're the one in charge and need to make a decision right now: do you have enough men to set an effective containment zone or should you wait for reinforcements? You have five seconds …

A. Yes, I have more than enough men and the best action is to set up the containment zone right away.

B. I don't have enough men under my command. It will give the zombie disease time to spread but I need to wait until reinforcements arrive before I can set up an effective containment zone.

What answer did you get?

A: You made the right decision, with 600 men you have more than enough to station two every three yards around the containment zone's perimeter.

B: You shouldn't have waited for reinforcements because you had enough men. This gave the disease time to spread to other city blocks and now you need to set up an even larger containment area. All this because you got your maths wrong!

How to work it out: This is a relatively simple calculation, but the trick is doing in the five seconds you have to make the decision. First, you need to work out the total length of the perimeter of your planned containment zone. The containment zone has four sides, each three city blocks long, and each block is 50 yards long. To work out the length of the perimeter, you just need to multiply these three numbers together (50 yards per block by three blocks per side by four sides). This tells you the total perimeter you need to cover is 600 yards. You the need to work out the total number of men you'd need to adequately cover it. To do this you need two men ever three yards. This is the same as saying you need 2/3rd of a man per yard, so you divide 600 by 3 and the multiply it by 2, giving a total of 400 men. You have 600, so you have more than enough to set up the perimeter right away and without wait for reinforcements.