

Maths With Zombies

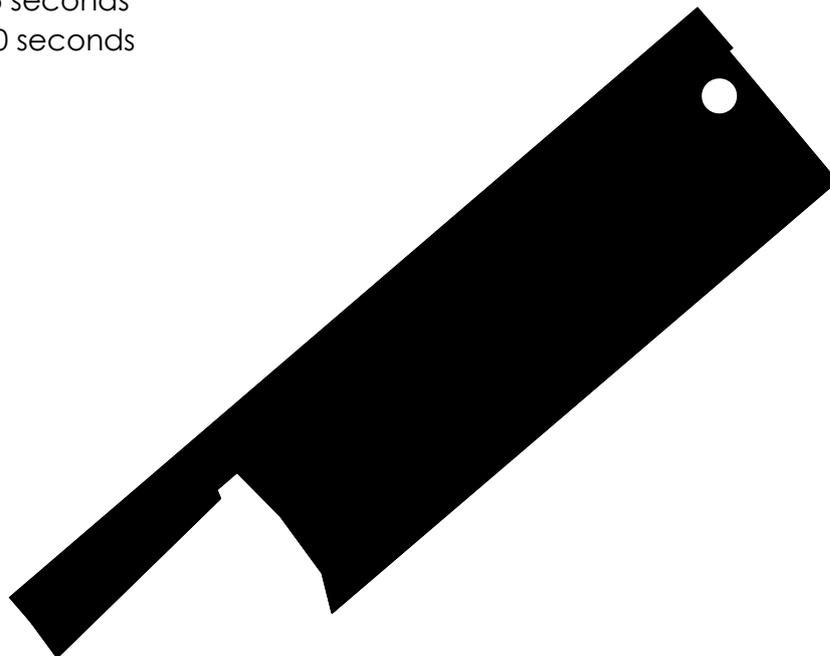
...because everything's better with zombies!

<http://MathsWithZombies.wordpress.com>

13 The Amputation Problem

You look at the bite on your hand and know instantly you've been infected. You know the virus spreads through your body along your lymph vessels and that once it reaches your heart, it will empty into your blood system and then it will be too late to do anything about it. You know the virus travels through your lymph vessels at 2.8 inches a second and that your arm is 16 inches long. How long do you have to amputate your arm before this 'treatment' becomes ineffective because the virus has already reached your heart? (**Note:** You will need to do the maths and amputate your arm in this time, so you'll need to work out the correct answer very quickly or you won't have time to act).

- A. 5 seconds
- B. 10 seconds
- C. 15 seconds
- D. 20 seconds



What answer did you get?

- A:** That's right, you only have five seconds to do the maths and amputate your arm before it's too late.
- B:** You really think you have that long? You'll have turned in almost half that time.
- C:** Something's gone really wrong with your maths there. Luckily (or unluckily) you won't live long enough to work out what.
- D:** Boy, just how slowly do you think this disease spreads? At this rate, you'll still be reaching for the meat cleaver by the time you turn.

How to work it out: This is a relatively simple calculation. It is just the length of your arm (16 inches) divided by the speed at which the virus spreads along your lymph vessels (2.8 inches per second). This means it will reach the end of your arm in 5.71 seconds. As you can see the maths here is easy. However, you need to make sure you do it fast and accurately. This is because you will need to arrive at the right answer quick enough to take the required action, and you won't have time to double-check your answer. In real life, this is sometimes the case with maths, and it is the speed at which you can arrive at the right answer that's important and not just whether you can do the calculation or not.

NOTE: This problem is based on how real disease, rabies, infects the human body. Rabies is probably as close as we get to a real zombie disease because it's spread through bites and turns people into violent, crazed attackers. The virus travels along nerves at a consistent speed, meaning you can work out exactly how long it will take to reach someone's brain once they have been bitten. This is the length of time you have to get medical treatment because once rabies reaches the brain it is pretty much 100% fatal.