

Solution

One easily sees that one of the hits must cover the point 0. If the inequality $L < 1/10$ were to hold, Ruprecht would need one separate blow for each of the six points 0, $1/10$, $1/5$, $1/3$, $1/2$ and 1 since these points are separated by a distance strictly greater than $1/10$. This shows that $L \geq 1/10$.

We now show that a fly swatter of length $L = 1/10$ is sufficient to kill all the mosquitoes within five blows:

- Blow 1 takes care of the interval $[0, L]$ and kills the mosquitoes at $1/k$ with $k \geq 10$.
- Blow 2 takes care of the interval $[1/9, 1/9 + L]$ and kills the mosquitoes at $1/k$ with $5 \leq k \leq 9$.
- Blow 3 takes care of the interval $[1/4, 1/4 + L]$ and kills the mosquitoes at $1/4$ and $1/3$.
- Blow 4 takes care of the interval $[1/2, 1/2 + L]$ and kills the mosquito at $1/2$.
- Blow 5 takes care of the interval $[1, 1 + L]$ and kills the mosquito at 1.

To summarize: the shortest possible length of the fly swatter is $L = 1/10$. The decimal representation of L is 0.1 and the second, third, fourth and all following digits after the comma are therefore 0. Answer #10 is correct.

However, the same number can also be represented as $L = 0.\overline{09} = 0.0999\dots$. Then the third digit in the decimal representation is 9. Therefore, answer #9 is also considered correct as well.