21 Tetrahedron

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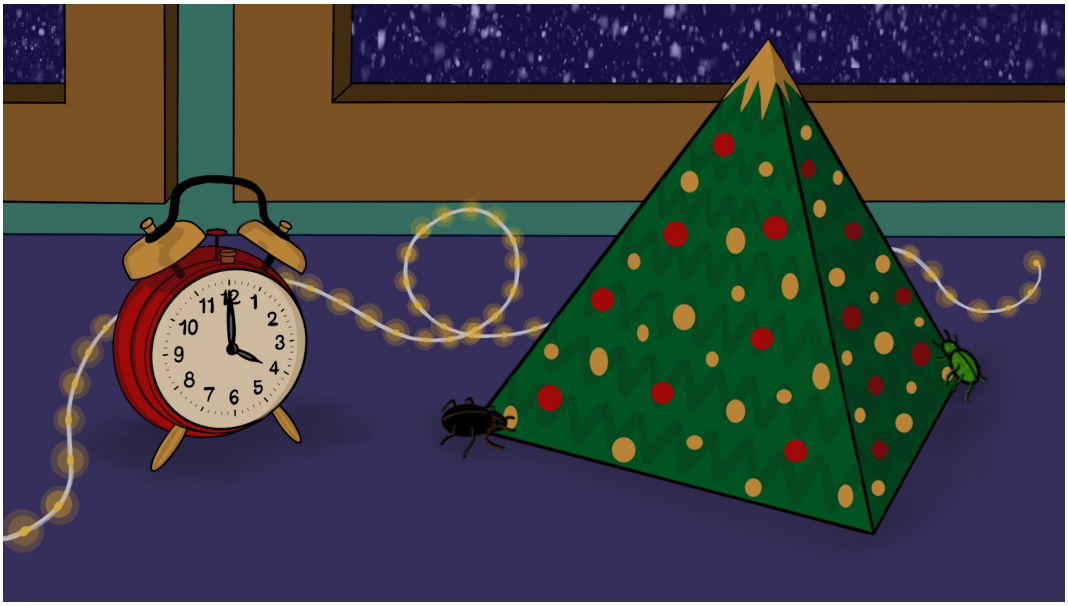
Challenge

A black and a green bug are sitting on a regular tetrahedron $ABCD$. The black bug starts its journey at 4 pm at vertex A, crawls with constant velocity along the edge AB, and reaches vertex B at 6 pm. The green bug starts its journey at 4 pm in vertex C, crawls with constant velocity along the edge CD, reaches vertex D at 5 pm, and then stays sitting in D.

We want to know from you: at which point T in time are the two bugs at minimum distance from each other?



Artwork: Frauke Jansen

Possible answers:

1. At time $T = 4{:}31\,\text{pm}$.
2. At time $T = 4{:}32\,\text{pm}$.
3. At time $T = 4{:}33\,\text{pm}$.
4. At time $T = 4{:}34\,\text{pm}$.
5. At time $T = 4{:}35\,\text{pm}$.
6. At time $T = 4{:}36\,\text{pm}$.
7. At time $T = 4{:}37\,\text{pm}$.
8. At time $T = 4{:}38\,\text{pm}$.
9. At time $T = 4{:}39\,\text{pm}$.
10. At time $T = 4{:}40\,\text{pm}$.