In-Class Worksheet

CS 181 Advanced Algorithms — Fall 2025

The Elevator Problem

You are at the bottom floor of Edmunds and want to go up.

- If you take the elevator, once it arrives it takes 15 seconds to get to the top.
- If you take the stairs, this always takes 45 seconds.

The elevator will arrive at some unknown time is $t \geq 0$. An online strategy can wait for the elevator and, at any time, give up and take the stairs instead. You want to go up as quickly as possible, what do you do?

1. If you knew the value of t, what would be the quickest route to the second floor?

2. Give an online strategy which always takes at most $5/3$ as long as the quickest route, despite not knowing t.
