

# Travel in an infinite desert

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When we tried to compute the coarse entropy for a class of systems given by homeomorphisms of the nonnegative reals, we encountered a problem that can be stated in terms of a travel in an infinite desert.

A caravan traverses an infinite desert studded with oases. It can rest indefinitely at each oasis. Given the sequence of the oases' locations, how does the number of the caravan's itineraries grow with time? We show that the growth is exponential when the oasis sequence is asymptotically linear, and subexponential when the oasis sequence is superlinear. Moreover, the growth has to be superpolynomial, but can be barely so.