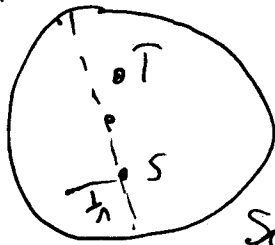


MAT 327 - Lecture 10 - Oct 18 2010

Reading, Munkres 23/24
Recall

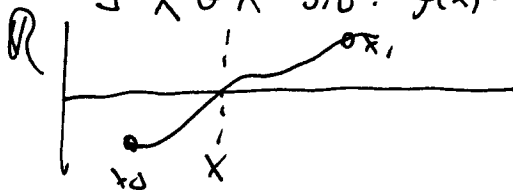


S, T move same speed.
 $ST > 0$, move h away.
 Safe for $\sum \frac{1}{n} < \infty$.
 Risk? May hit boundary.
~~Space between too small~~

Next riddle - Show that any potato, you can find two congruent curves (full loops around).

Theorem: (Intermediate value theorem).

Let $f: X \rightarrow \mathbb{R}$ cont.
 if X is connected, $\exists x_0, x_1 \in X$ s.t.
 $f(x_0) < 0, f(x_1) > 0$, THEN
 $\exists x \in X$ s.t. $f(x) = 0$.



Defⁿ: A "separation" of X is a presentation,
 $X = U_1 \cup U_2$ (i.e. $X = U_1 \cup U_2, U_1 \cap U_2 = \emptyset$)
 such that U_1, U_2 open, non-empty.

Equivalently, can write $X = F_1 \cup F_2, F_1, F_2$ (closed and nonempty. (Note that $U_1 = U_2^c, F_1 = F_2^c, \dots$).

Defⁿ: A set is "clopen" if it is both closed and open.

So, a separation of $X \iff$ A non-trivial clopen set in X
 (i.e. not \emptyset , not X).