Math 7H | Professor: Padraic Bartlett

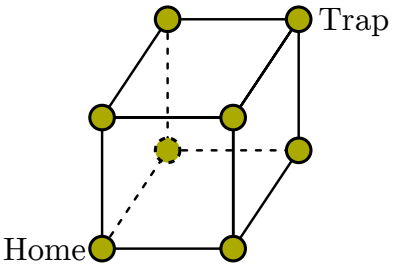
Homework 5: Electrical Networks and Graphs

Due Tuesday, week 7, at the start of class | *UCSB*

Reminder: because of Veteran's day, there is no class on week 6. Enjoy the break!

Checkdown problem.

1. Take a cube. Suppose that we have an ant walking randomly on the edges of this cube, that starts at one corner and wanders until it either returns to that corner, or makes it to the opposite corner.



What are the odds that the ant makes it to the opposite corner?

Extra-credit problem.

1. Generalize the problem above as follows: take a n-dimensional cube, which you can think of as all of the points in $\mathbb{R}^n$ with coordinates of the form $(\pm 1, \pm 1, \ldots \pm 1)$. Suppose that a random walker starts at $(-1, -1, -1, \ldots -1)$, and randomly walks along edges of this cube until they either return to $(-1, -1, -1, \ldots -1)$ or make it to $(1, 1, 1 \ldots 1)$. What are the chances that the walker makes it to $(1, 1, 1 \ldots 1)$?