

Homework Set 11

DUE: NEVER

We will use eigenvalues again next week, so here are some inspiring reading to help you remember that:

- Ever wonder how Google got started? Eigenvalues are part of that story! Read this article on Google's original page rank method, written by Brian White from Stanford University: <https://www.dropbox.com/s/k16n7hnsreaxpvz/PageRank.pdf?dl=0>
- This article on Quanta magazine on a recent accidental discovery by three physicist of a previously unknown relation between eigenvalues: <https://www.quantamagazine.org/neutrinos-lead-to-unexpected-discovery-in-basic-math-20191113/> (Many thanks to Clara and Estelle for point this article out!)

How about some real problems now:

1. 8.9.4
2. 8.9.7
3. (Fall 2018 Final) Find the general solution of:

$$t^2 y'' + 2ty' - 2y = t^2, \quad t > 0,$$

by first finding a solution of the form $y_1(x) = t^r$ to the homogeneous problem:

$$t^2 y'' + 2ty' - 2y = 0,$$

and then using reduction of order.