Introduction

This assignment is designed to prepare you for our third class meeting. Complete it before our meeting on Wednesday, January 22.

Goals

Before the next class meeting, a student should be able to:

- Compute the dot product of two vectors.
- Compute the norm (length) of a vector.
- explain the connection between the norm of a vector and the Pythagorean theorem.
- Compute the angle between two vectors.
- "Normalize" a given vector. That is, find a unit vector pointing in the same direction as a given vector.

After the next class meeting, a student should be able to:

- Explain the connections between dot products and the equations of hyperplanes.
  - Find a vector normal to a given hyperplane.
  - Find the equation of a hyperplane normal to a given vector and through a given point.
- Describe level sets of the dot product with a given vector.

Reading

Required: *Strang* Section 1.2, pages 11-18.
Optional: *Hefferon* Chapter One: Systesm of Equations, Part II Linear Geometry, section II.2 Length and Angle Measures, pages 39-43.

Exercises

The minimal exercise set is Strang, Section 1.2 exercises 1, 6, 7, 8, 12, 13.

Note: Strang's text has wonderful exercises. A student with the time to do it would do well to complete more exercises than listed here.

Sage Playtime

In the set of Sage files I have given you, explore these:

- SageBeginnerTutorial.sagews
- meeting02-lines-and-planes-in-sage.sagews

Both can be found in the directory `Hitchman/Sage_help`.