

# RECITATION QUESTIONS – VECTORS

## 18 FEBRUARY

*Your assessment for this recitation will be a brief question about the homework that you turned in today. You may discuss it with your group, but each person should answer individually. There will be a Blackboard quiz that “goes live” ten minutes before the end of the recitation period. Five minutes before the end of the recitation period, you should stop what you are doing and answer the question on Blackboard.*

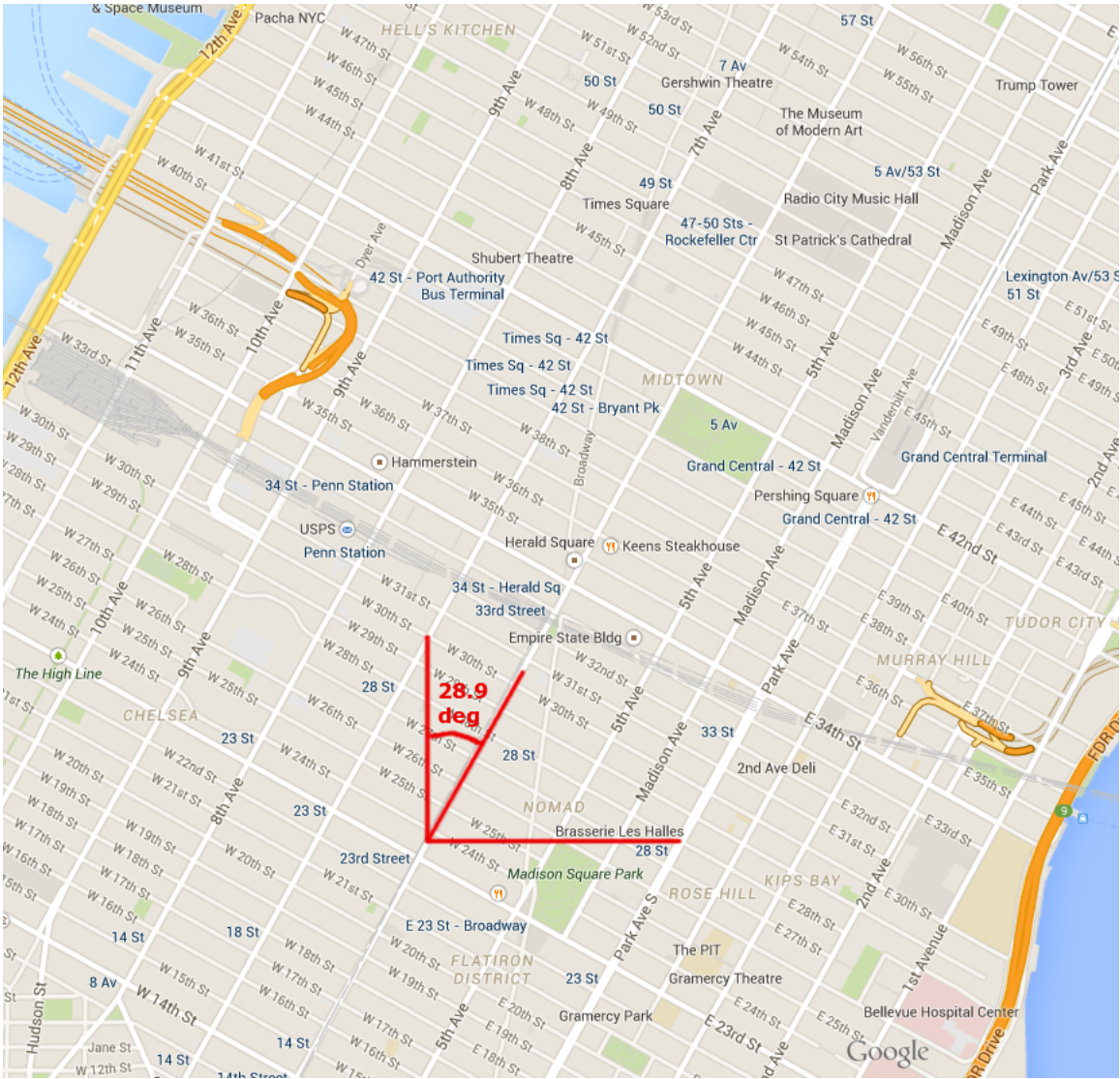
In this recitation, you will practice:

- Converting vectors from “magnitude and direction” representation to “ $x$ – and  $y$ –component” representation
- Breaking vectors into their  $x$ – and  $y$ – components
- Representing vectors in different coordinate systems
- Using vector addition and subtraction to solve problems

The streets in Manhattan are laid out in a grid, but that grid is aligned with the island, rather than along the compass directions. Avenues run 28.9 degrees east of north, while streets run 28.9 degrees north of west. This means that there are two sensible coordinate systems in Manhattan:

- North/South/East/West, aligned with the compass
- Uptown/Downtown/Crosstown, aligned with the streets.

The staff astronomer at the Natural History Museum walks from Penn Station to the Natural History Museum, going 3.3 km north along Eighth Avenue. How far east and how far north did she walk? (*Note: Her path carries her off of the top of the page. You will want to draw an arrow aligned with her path below, and then draw its components.*)



(In this map and the next one, “up” is due north.)

