

MATH 335 Quiz 7

Name: _____

Show all work. 20 points .

Assume that a Chicago Taxi company has 1500 cabs in a city and they reside in one of three areas. O'Hare Airport, Downtown or Midway airport. **Each hour** the following transitions occur:

- a) 90% of O'Hare cabs stay in the O'Hare area, 1% go downtown and 9% go to Midway.
- b) 90% of downtown cabs stay in the downtown area, 9% go O'Hare and 1% go to Midway.
- c) 90% of Midway cabs stay in the Midway area, 1% go O'Hare and 9% go to downtown.

- 1) Find the transition matrix that represents this movement
- 2) Find the eigenvalues and eigenvectors corresponding to this matrix.
- 3) Explain, in detail, what happens over time and justify your answer.
- 4) Specifically: What eventually happens after **2 days (48 hours)**if initially there are 800 cabs downtown, 700 at O'Hare and 0 at Midway?