MATH 335 Quiz 8 Name:

Show all work. 10 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 in terms of the eigenvalues and eigenvectors.

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?