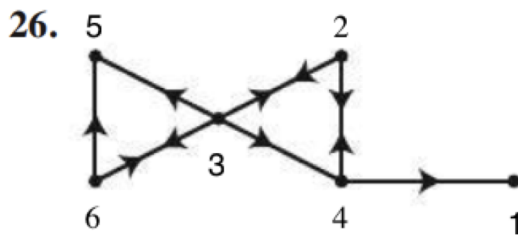
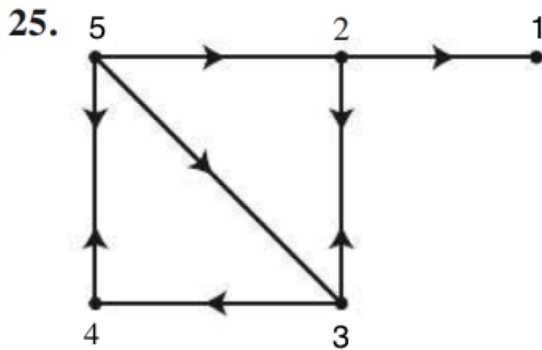


MATLAB Exploration #4 for MATH 1554

For each MATLAB assignment, follow the step-by-step formatting guidelines we provided. You will be graded on completeness, following directions, proper usage of comments, and overall readability of your code and published .pdf submission. We recommend **format bank**

For Week 12: MATLAB #4 - Google matrix - for Problems 25 and 26 shown below do the following:

Find the google matrix G for the link diagram and indicate the PageRank for each page. In the comments explain the meaning of $G^k(1, 2)$ the entry of G^k in row 1 and column 2, the meaning of $G^4(\cdot, 3)$ the 3rd column of G^4 , and the meaning of $G^k(\cdot, 3)$ the 3rd column of G^k , in the context of webpages.



Also, for each google matrix G , find and indicate in the comments the smallest k such that every entry of G^k is within four significant digits to Π , as in Theorem 1 (Page L10-18). Using appropriate comments in your MATLAB code, interpret the meaning of the value of $\lim_{k \rightarrow \infty} G^k(i, j)$, in the context of webpages.

THEOREM 1

If P is a regular $m \times m$ transition matrix with $m \geq 2$, then the following statements are all true.

- There is a stochastic matrix Π such that $\lim_{n \rightarrow \infty} P^n = \Pi$.
- Each column of Π is the same probability vector \mathbf{q} .
- For any initial probability vector \mathbf{x}_0 , $\lim_{n \rightarrow \infty} P^n \mathbf{x}_0 = \mathbf{q}$.
- The vector \mathbf{q} is the unique probability vector which is an eigenvector of P associated with the eigenvalue 1.
- All eigenvalues λ of P other than 1 have $|\lambda| < 1$.