1. **Link analysis with PageRank**

1. Given is the following graph:

   ![Graph](image)

   a. Order the nodes in the graph based on the estimated PageRank values (You do not have to compute PageRank now!). Justify your answer.

   b. Create the link matrix $A'$ with teleportation for this graph. Use the teleportation probability of 25%.

   c. Given the PageRank formula:

   $$
   \tilde{x}^{k+1} = (1 - c)\tilde{x}^k A + \frac{c}{N} \tilde{e}
   $$

   $\tilde{e}$ is $\frac{1}{N}$. In $\tilde{x}_0$ the random walk is uniformly distributed. Compute the vector $\tilde{x}$ for the first five iterations of the PageRank formula ($k = 0..4$) for this graph. Round to 5 decimal places!

   *Remark: make use of the link matrix with teleportation $A'$*