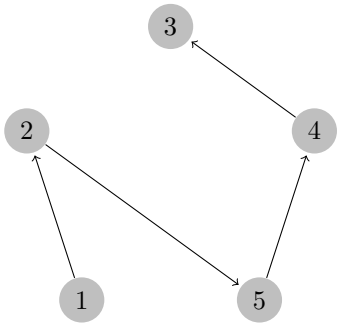
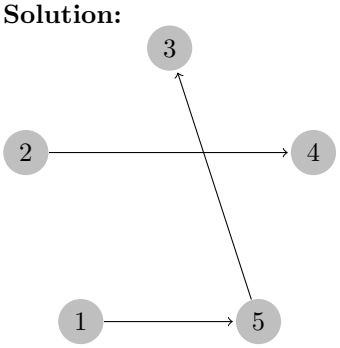
Answer the questions in the spaces provided on the question sheets. If you run out of room for an answer, continue on a separate sheet of paper.

1. Define the directed graph G as follows:



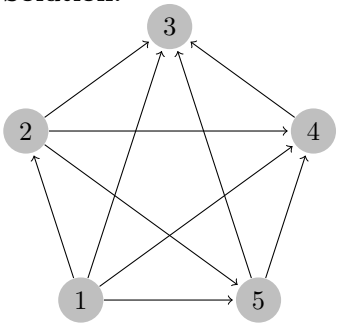
(a) Find G^2.

Solution:

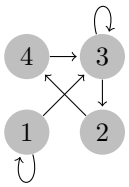


(b) Find G^+.

Solution:



2. Define the directed graph G as follows:



(a) Complete the *adjacency matrix*, A, for G.

Solution:

$$\begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$

(b) Compute A^2.

Solution:

$$\begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}$$