

## Worksheet 1.2 - Math 455

1. Show that if  $A$  is the adjacency matrix of some graph  $G$ , then  $[A^k]_{i,j} = 0$  for all  $1 \leq k < d(v_i, v_j)$ .
2. Find  $A^3$  where  $A$  is the adjacency matrix of  $K_4$  without computing it directly.
3. If  $A$  is the adjacency matrix of some graph  $G$ , show that  $[A^2]_{j,j} = \deg(v_j)$ .