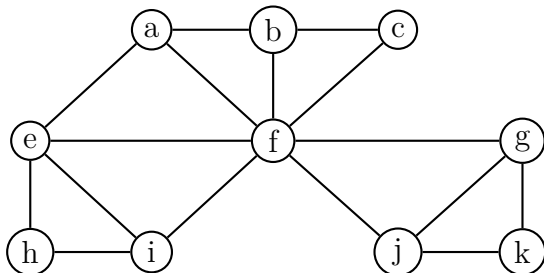


## Weekly Problems 7

Due: 23 Feb 2024 at midnight EST as a PDF on Submitty

v1.0: Last Updated February 22, 2024

1. Is a closed ear decomposition of the below graph possible? What about an open ear decomposition? Draw one for each if possible. What does this prove about its connectivity and edge-connectivity?



2. Graph  $G$  has the following properties:
  - (a) Maximum degree  $\Delta(G) = 4$ .
  - (b) Minimum degree  $\delta(G) = 2$ .
  - (c)  $\forall u, v \in V(G) : \exists$  a  $u, v$ -path.
  - (d)  $\forall u, v \in V(G) : \exists$  a closed  $u, v$ -trail.

Put tight upper and lower bounds on  $k, k'$  for which  $G$  could be  $k$ -connected and  $k'$ -edge-connected, given these properties. Prove your responses.