LARSON—MATH 556—CLASSROOM WORKSHEET 09
Connectivity.

Concepts & Notation

• Sec. 2.2: cut edge, $\omega$, spanning tree, edge cut $[S, \bar{S}]$, bond.
• Sec. 2.3: cut vertex, connector (non-cut vertex).
• Sec. 3.1: vertex cut, $\kappa$, edge cut, $\kappa'$.
• Sec. 3.2: block, internally disjoint paths, Whitney’s theorem, Menger’s theorem

Classwork Problems

1. For the path graph $P_4$ (left) classify the vertices as cut-vertices or connectors.

2. For the cycle graph $C_6$ (middle) classify the vertices as cut-vertices or connectors.

3. For the graph $C_{2,2}$ (right) classify the vertices as cut-vertices or connectors.
**Facts** (proved)

(1) Every non-trivial tree has at least 2 degree-1 vertices.
(2) Every connected graph has a spanning tree.

4. Prove: Every non-trivial tree has at least 2 connectors.

5. Prove: Every non-trivial connected graph has at least two non-cut vertices.