

# MCS-236 Homework 8

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In this exercise we will show that no hypothesis of CZ Exercise 1.17(a) can be dropped or relaxed if the conclusion is to hold.

1. Prove that there exists a graph  $G$  (not necessarily connected) containing longest paths  $P$  and  $Q$  that share no common vertex.
2. Prove that there exists a connected graph  $G$  containing paths  $P$  and  $Q$  such that  $P$  and  $Q$  are second longest in  $G$  and yet  $P$  and  $Q$  share no common vertex.