Pre-lecture exercises will not be collected for credit. However, you will get more out of each lecture if you do them, and they will be referenced during lecture. We recommend **writing out** your answers to pre-lecture exercises before class. Pre-lecture exercises usually should not take you more than 20 minutes.

Consider the following graph, which represents a network of extremely rickety bridges between towers. The bridges are directed, so you can only walk along them in the correct direction.
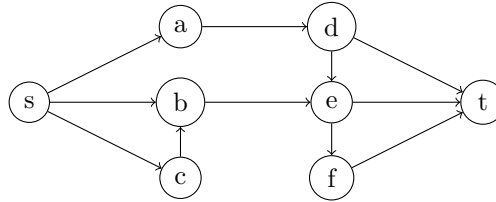
1. What is the minimum number of bridges that could collapse that would disconnect s from t?

2. Suppose that a bunch of people want to get from tower s to tower t. But there are some rules about how people can cross the bridges:

   - Only one person can be on a bridge at a time (since it's so rickety).
   - Everyone takes one time unit to cross any given bridge.
   - As many people can be in a tower at a time as you like, but they all want to keep moving. So no one is willing to enter a tower other than s or t if they don't immediately leave it.

   What's the most efficient way to route a bunch of people through? (Assuming that traffic is going to keep moving for the forseeable future). How many people can enter tower t at a time?

3. Same two questions with the graph below.
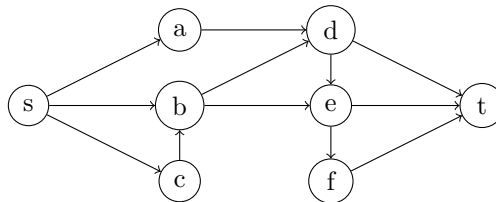
4. Find a graph where the answers to the two questions are different.