Worksheet #24:
Analyzing Parallelism in an Actor Pipeline

Name: ___________________          Netid: ___________________

Consider a three-stage pipeline of actors set up so that P0.nextStage = P1, P1.nextStage = P2, and P2.nextStage = null. The process() method for each actor is shown below. Assume that 100 non-null messages are sent to actor P0 after all three actors are started, followed by a null message. What will the total WORK and CPL be for this execution? Recall that each actor has a sequential thread.

Input sequence
\[ \ldots d_9d_8d_7d_6d_5d_4d_3d_2d_1d_0 \]

```
1. protected void process(final Object msg) {
2.     if (msg == null) {
3.         exit();
4.     } else {
5.         doWork(1); // unit work
6.     }
7.     if (nextStage != null) {
8.         nextStage.send(msg);
9.     }
10. }
```

Figure 5.6
(a) Pipeline structure
(b) Timing diagram