Worksheet #22: Analyzing Parallelism in an Actor Pipeline

Consider a three-stage pipeline of actors (as in slide 5), set up so that \( P_0.\text{nextStage} = P_1 \), \( P_1.\text{nextStage} = P_2 \), and \( P_2.\text{nextStage} = \text{null} \). The process() method for each actor is shown below.

Assume that 100 non-null messages are sent to actor \( P_0 \) 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.

```
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. }
```