Worksheet: Analyzing Parallelism in an Actor Pipeline

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  P_0 = P_1 = P_2 = P_3 = P_4 = P_5 = P_6 = P_7 = P_8 = P_9
```

```
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. }
```

