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.

```
protected void process(final Object msg) {
    if (msg == null) {
        exit();
    } else {
        doWork(1); // unit work
    }
    if (nextStage != null) {
        nextStage.send(msg);
    }
}
```

**Input sequence**

\[d_9d_8d_7d_6d_5d_4d_3d_2d_1d_0 \ldots\]

**WORK = 300, CPL = 102**