**Q1.2**

**Table

Description automatically generated**

One of the problems that becomes apparent is that after transitioning from mode {2} to {1}, the ball tends to slide down all the way down {1}. This is because the number of events triggered becomes so large that it bypasses ode45’s counter and it thus misses the final transition when it switches to mode {1} at the end.

**Q1.4**

1. h = 0.04

Text

Description automatically generated

1. h = 0.02

Text

Description automatically generated

1. h = 0.01

Text

Description automatically generated

In the event based simulation, the ball tends to slide down the path 1 after it reaches the final contact mode of {1} whereas in the time stepping simulation, the eom solver can handle higher oscillation frequencies and as a result the ball is able to oscillate and end up at the {1,2} contact mode.