1 8.1

$$\frac{d[ES]}{dt} = k_1[E][S] - k_2[ES] - k_3[ES] \tag{1}$$

$$\frac{d[E]}{dt} = k_2[ES] + k_3[ES] - k_1[E][S] \tag{2}$$

$$\frac{d[S]}{dt} = k_2[ES] - k_1[E][S] \tag{3}$$

$$\frac{d[P]}{dt} = k_3[ES] \tag{4}$$

2 8.2

Final concentration of E = 0.9999999442422705 µm

Final concentration of ES = 5.575771576830324e-08 µm

Final concentration of P = 9.999999536112117 µm

Final concentration of S = 4.0813006299449143e-07 µm

3 8.3

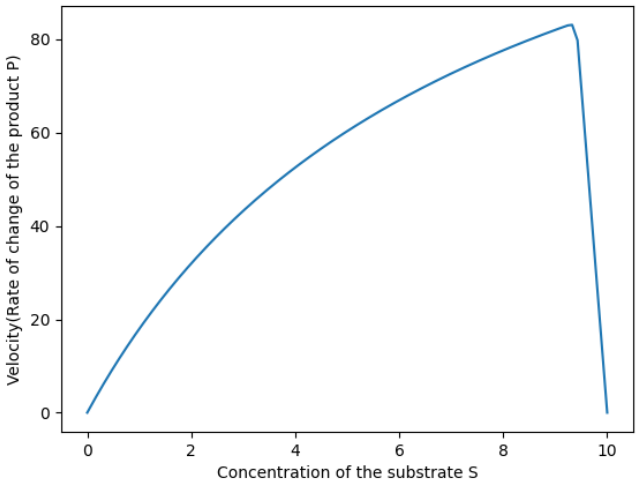

Figure 1: Graph generated by Python

According to the graph, Vm= 82.64953649378555 µm/min