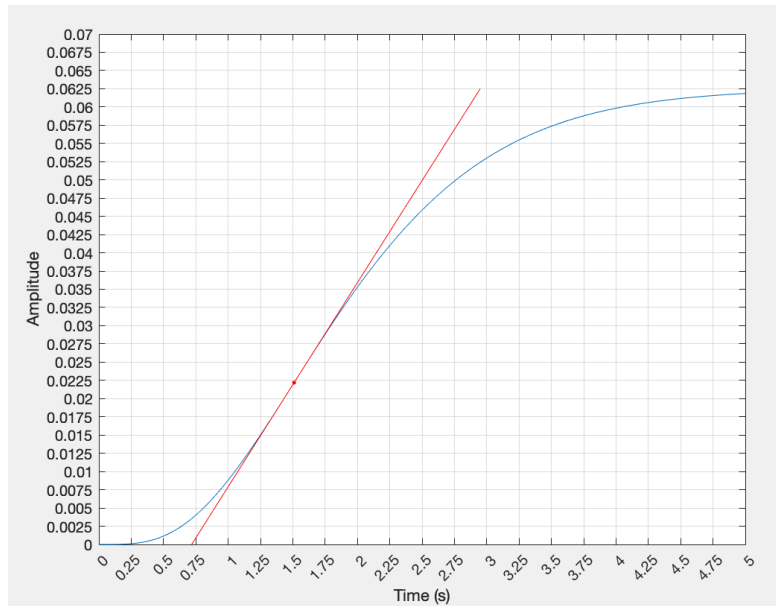
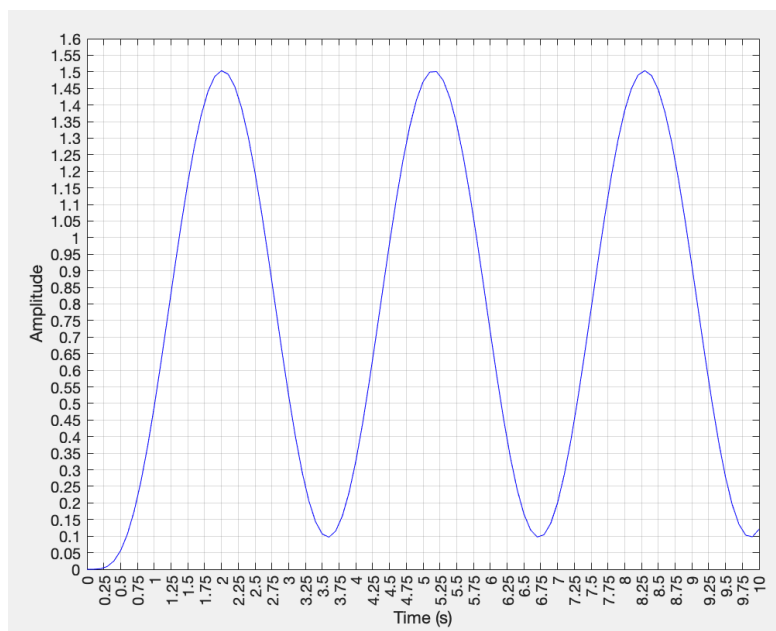


**BME 444**  
**HW 10 - Due May 2, 2023**

1. Use the reaction curve method to estimate the  $K_P$  and  $K_I$  gains for a PI controller using the following reaction curve.



2. Use the ultimate gain method to estimate  $K_P$ ,  $K_I$ , and  $K_D$  gains for a PID controller. Assume the ultimate gain is  $K = 64$ .



3. The root locus plot of a system is shown below. Is it possible to adjust the gain,  $K$ , of this system to achieve  $\zeta = 0.74$  and  $\omega_n = 10$  rad/sec? Why or why not?

