Tutorial 9

Problem 1)

- (not in textbook) A closed-loop system is composed of a feedforward path with a PID controller $G_c(s)$ in cascade with a plant $G(s)$ and a negative feedback carrying a sensor $H(s)$, where

$$G_c(s) = 2 + \frac{0.1}{s} + sK_d \qquad G(s) = \frac{10}{(s+1)^2} \qquad H(s) = 0.1$$

  - Sketch the system's root locus as precisely as possible for a non-negative parameter K_d.
  - Find the value of K_d such that one of the closed-loop poles is at -10. Find the other closed-loop poles.