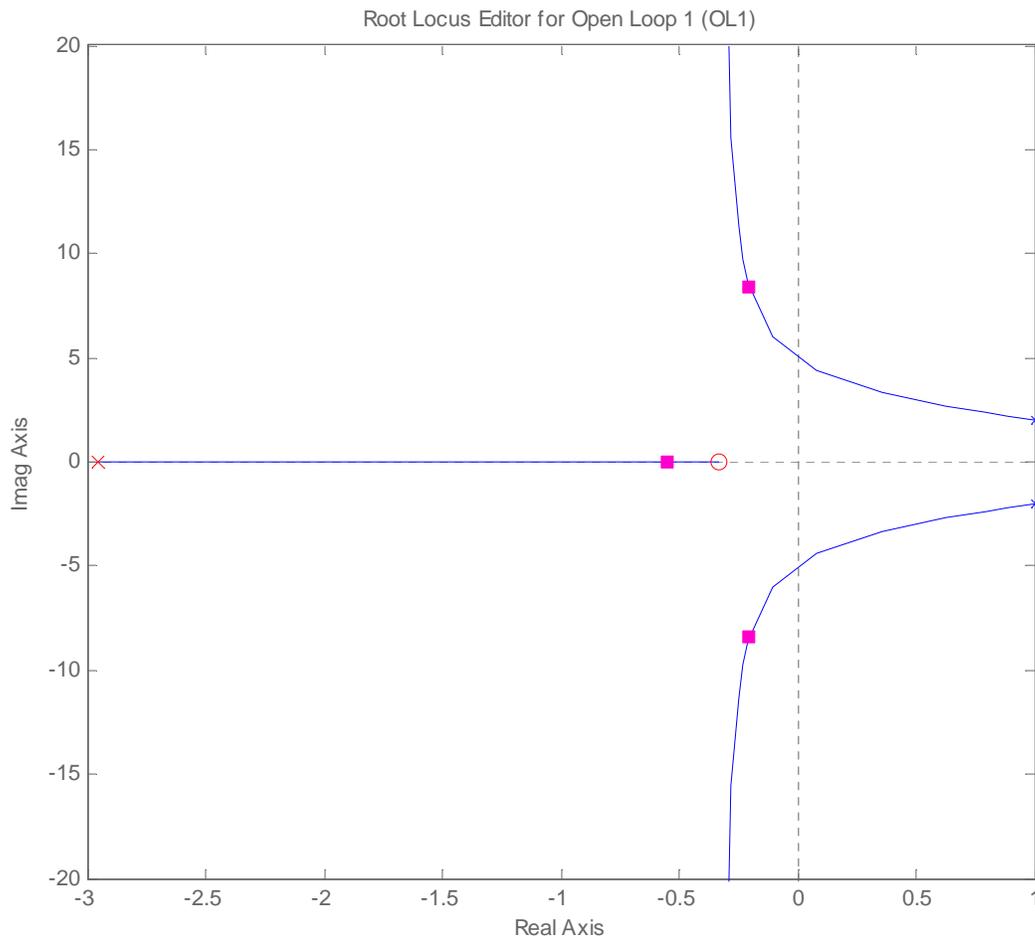


**ECE-320, Quiz #6**

Problems 1-3 refer to the following root locus plot for a unity feedback system with a plant and a controller.



1) Based on this root locus plot, the best estimate of the poles of the closed loop system are

- a)  $-0.3+j7, -0.3-j7, -0.6$     b)  $1+j2, 1-j2, \text{ and } -3$

2) Is this a type one system?

- a) yes    b) no

3) Is this a stable system?

- a) yes    b) no

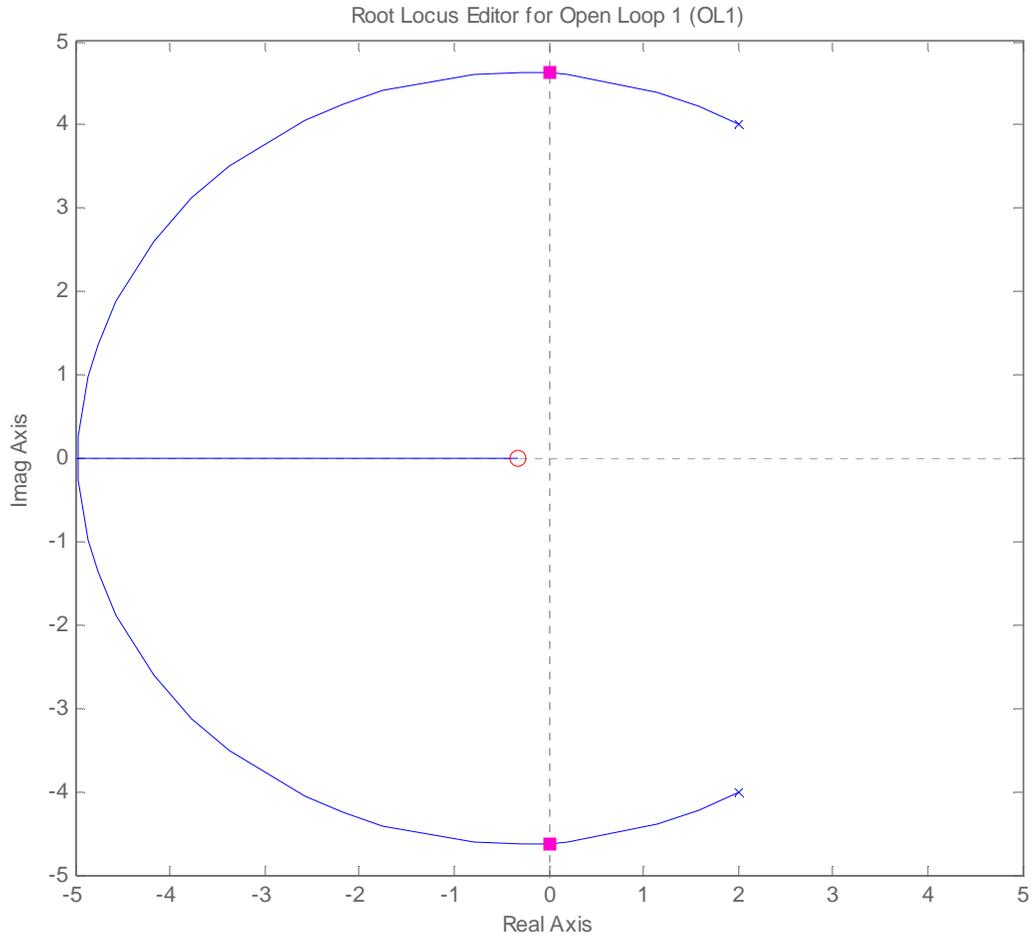
Name \_\_\_\_\_

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4) Consider the following root locus plot for a plant and controller in a unity feedback configuration.

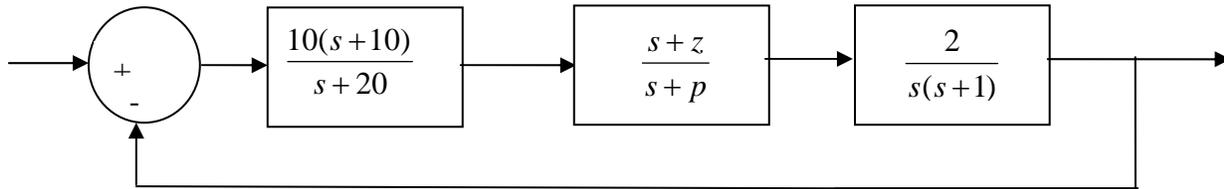
If we want the system to be stable, should we

- a) increase the gain    b) decrease the gain    c) do nothing



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5) Assume we are adding a lag compensator to change the steady state error for a ramp input, as shown below



If we want the **steady state error** for a unit ramp input to be 0.001 and we choose  $z = 0.1$ , what should  $p$  be?

- a) 1   b) 0.1   c) 0.01   d) 0.001

6) With the lag compensator in the system (as shown in problem 5) do we expect the **settling time** of the system to

- a) increase   b) decrease   c) remain the same