

## Problem 28

Consider the equation  $ay'' + by' + cy = 0$ , where  $a$ ,  $b$ , and  $c$  are constants with  $a > 0$ . Find conditions on  $a$ ,  $b$ , and  $c$  such that the roots of the characteristic equation are:

- (a) real, different, and negative.
- (b) real with opposite signs.
- (c) real, different, and positive.