Rule F: $j\omega$-crossings

Do the branches of the root locus cross the $j\omega$ axis?
(transition from *stability* to *instability*)

Goal: determine if the equation

$$a(j\omega) + Kb(j\omega) = 0$$

has a solution $\omega \geq 0$ for some $K > 0$.

Best approach here: use the *Routh test* to first determine the
critical value of K (when the characteristic polynomial becomes
unstable), then plug it in and solve for $j\omega$-crossings
(numerically or analytically).