

# ECE 461/661 Handout #20

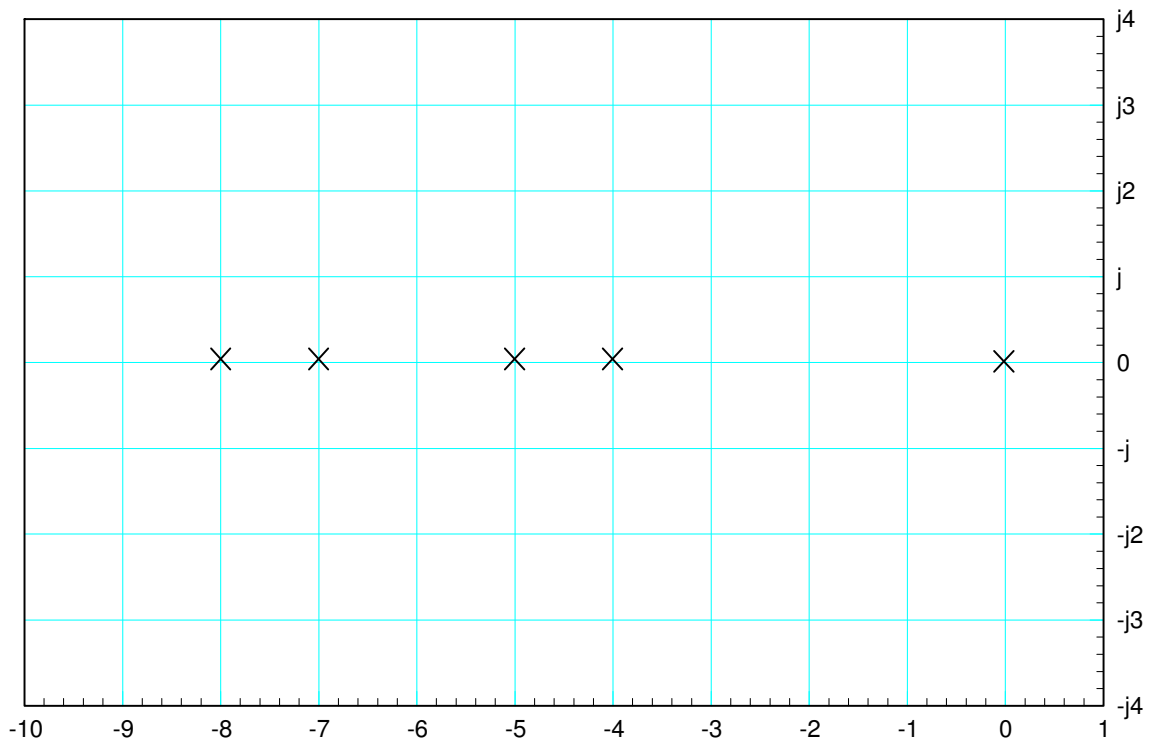
Root Locus (real poles)

Sketch the root locus for

$$G(s) = \left( \frac{2000}{s(s+4)(s+5)(s+7)(s+8)} \right)$$

Determine

Real Axis Loci	
Breakaway Point(s)	
jw Crossing	
Asymptotes	



## Solution

$$G(s) = \left( \frac{2000}{s(s+4)(s+5)(s+7)(s+8)} \right)$$

Real Axis Loci	<b>(0, -4) (-5, -7), (-8, -infinity)</b>
Breakaway Point(s)	<b>-1.091, -6.066</b> approximate or find numerically
jw Crossing	<b>+/- j2.334</b> approximate or find numerically
Asymptotes	<b>5 asymptotes</b> <b>+/- 36 degrees,</b> <b>+/- 108 degrees,</b> <b>180 degrees</b> <b>Intercept = -4.80</b>

