Ejercicios de Funcion de Transferencia

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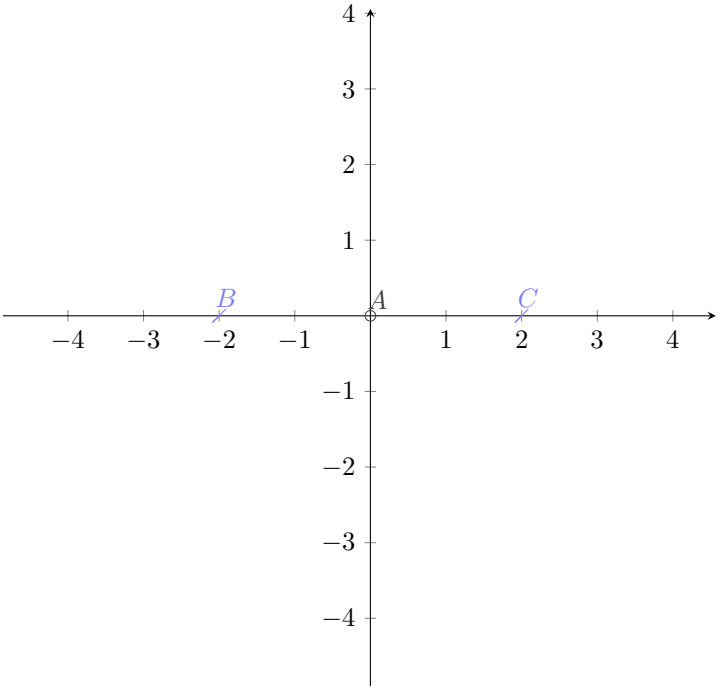
Determinar los ceros y los polos de las siguientes funciones de transferencia y gratificarlos en el plano complejo ,decir s el sistema es *estable* o *inestable*

1. La funcion $F(s) = \frac{(s+3)}{s^2+4}$ Determinar si el sistema es estable o inestable
   $F(s) = \frac{(s+3)}{s^2+4}$ $s^2 + 4 = 0$ $s = \frac{-b \pm \sqrt{b^2 \check{} 4ac}}{2a}$

   $s = 0 \pm \frac{\sqrt{0^2-4(1)(4)}}{2(1)}$ $s = \pm\frac{\sqrt{-16}}{2}$

   $s = \pm\frac{\sqrt{-1\sqrt{16}}}{2}$ $s = \pm 2j$ $s_1 = s2$ & $s_2 = -2j$

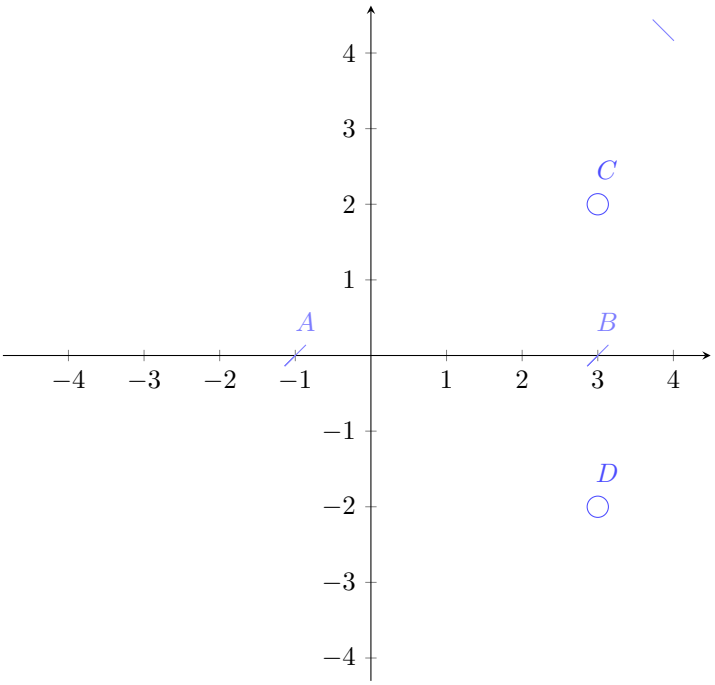


   No es estable

2. La funcion $Ft = \frac{/s+3}{s^3+2s^2-s-2}$ Determina el estado del sistema.

$Ft = \frac{s+3}{s^3+2s^2-s-2}$ $\quad s = 0 \pm \frac{\sqrt{0^2-4(1)(1)}}{2(1)}$

$= \pm\frac{\sqrt{-4}}{2}$ $\quad = \pm 2j$

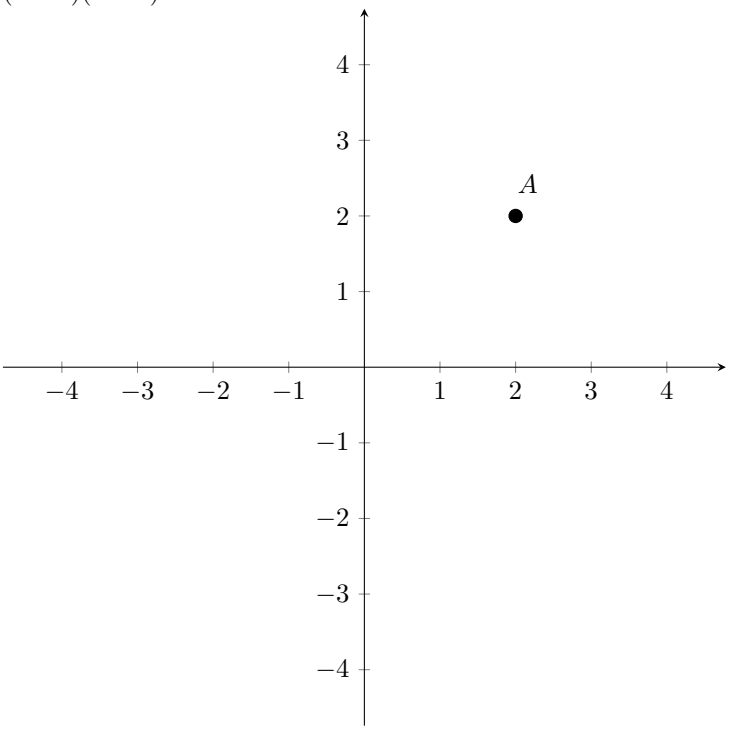


Es estable

3. $Ft = \frac{s-1}{s^2-4s+4}$

$s^2 - 4s + 4$

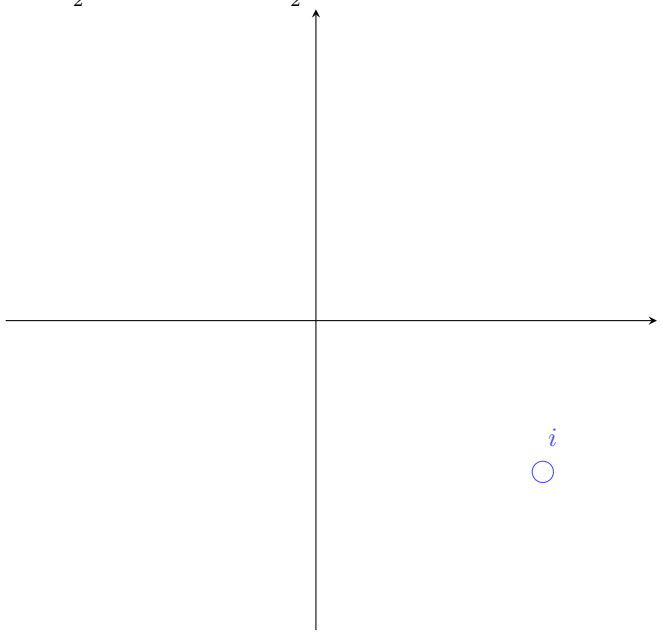
$s^2 - 4s + 4 = 0$
$(s-2)(s-2) = 0$ $s = 2$ & $s = 2$



Es inestable y (estable) al borde

4. $Ft = \frac{1}{s^2+s+1}$

$s^2 + s + 1 = 0$
$s^2 + s + 1 =$
$(1)(1)(1)$
$s = -1 \pm \frac{\sqrt{1-4(1)(1)}}{2(1)}$
$= \frac{-1\pm\sqrt{-3}}{2}$
$\frac{1\pm\sqrt{-3}}{2}$
$\frac{-1\pm\sqrt{3i}}{2}$
$s = \frac{-1+\sqrt{3i}}{2}$ $s = \frac{-1-\sqrt{-3i}}{2}$



es inestable