1 d) $P(s) = s^4 + s^3 + 3s^2 + 3s + 2$

$+4$	1	3	2		
$+3$	1	3			
$+2$	ε	2			
-1	$\frac{3\varepsilon-2}{\varepsilon}$				
$+0$	2				

two sign changes

$$b_{n-1} = -\frac{(1\cdot 3 - 1\cdot 3)}{1} = \phi$$

$$b_{n-3} = -\frac{(1\cdot 0 - 1\cdot 2)}{1} = 2$$

Special case 1:

- If a first-column term in any row is zero, but the remaining terms are not zero or there is no remaining term
  → the zero term is replaced by a very small positive number ε.

$$c_{n-1} = -\frac{(1\cdot 2 - \varepsilon\cdot 3)}{\varepsilon} = \frac{3\varepsilon - 2}{\varepsilon}$$

$$d_{n-1} = -\frac{(\varepsilon\cdot\phi - \frac{3\cdot\varepsilon-2}{\varepsilon}\cdot 2)}{\frac{3\cdot\varepsilon-2}{\varepsilon}} = 2$$

Considering $\varepsilon > 0$ (but very small):

$$\frac{3\cdot\varepsilon - 2}{\varepsilon} = 3 - \frac{2}{\varepsilon} \rightarrow c_{n-1} \text{ will have negative sign}$$

∴ $P(s)$ has two roots with real part.