UAI - Laboratorio de Cálculo

TRABAJO PRÁCTICO 1

Gerardo Tordoya - 08-sep-2020

****

M) Resolver

Ejercicio 102

$$\frac{2x^2 - 9x + 4}{x^2 - 5x + 4} = 0$$

Conjunto numerador N:

$$2x^2 - 9x + 4 = 0$$

$$x^2 - \frac{9}{2}x + 2 = 0$$

$$\left(\frac{9}{4}\right)^2 - U^2 = 2$$

$$\frac{81}{16} - U^2 = 2$$

$$U^2 = \frac{81}{16} - 2 = \frac{81 - 32}{16} = \frac{49}{16}$$

$$U = \sqrt{\frac{49}{16}} = \pm\frac{7}{4}$$

$$x_1 = \frac{9}{4} + \frac{7}{4} = \frac{16}{4} = 4$$

$$x_2 = \frac{9}{4} - \frac{7}{4} = \frac{2}{4} = \frac{1}{2}$$

$$N = \left\{4\,;\,\frac{1}{2}\right\}$$

Conjunto denominador D:

$$x^2 - 5x + 4 = 0$$

$$\left(\frac{5}{2}\right)^2 - U^2 = 4$$

$$\frac{25}{4} - U^2 = 4$$

$$U^2 = \frac{25}{4} - 4 = \frac{25-16}{4} = \frac{9}{4}$$
$$U = \sqrt{\frac{9}{4}} = \pm\frac{3}{2}$$

$$x_1 = \frac{5}{2} + \frac{3}{2} = \frac{8}{2} = 4$$
$$x_2 = \frac{5}{2} - \frac{3}{2} = \frac{2}{2} = 1$$

$$D = \{4\,;\,1\}$$

Conjunto solución :

$$S = N - D = \left\{4\,;\,\frac{1}{2}\right\} - \{4\,;\,1\} = \left\{\frac{1}{2}\right\}$$

Ejercicio 103

$$\frac{5x^3 - 6x^2 + x}{4x^2 - 5x + 1} = 0$$

Conjunto numerador N :

$$5x^3 - 6x^2 + x = 0$$
$$x\left(5x^2 - 6x + 1\right) = 0$$

Resolviendo el 1er término por Hankeliana :

$$x_1 = 0$$

Resolviendo el 2do término por Po – Shen Loh :

$$5x^2 - 6x + 1 = 0$$
$$x^2 - \frac{6}{5}x + \frac{1}{5} = 0$$

$$\left(\frac{3}{5}\right)^2 - U^2 = \frac{1}{5}$$
$$\frac{9}{25} - U^2 = \frac{1}{5}$$
$$U^2 = \frac{9}{25} - \frac{1}{5} = \frac{9-5}{25} = \frac{4}{25}$$

$$U = \sqrt{\frac{4}{25}} = \pm\frac{2}{5}$$

$$x_2 = \frac{3}{5} + \frac{2}{5} = \frac{5}{5} = 1$$
$$x_3 = \frac{3}{5} - \frac{2}{5} = \frac{1}{5}$$

$$N = \left\{0\,;\ 1\,;\ \frac{1}{5}\right\}$$

Conjunto denominador D:

$$4x^2 - 5x + 1 = 0$$
$$x^2 - \frac{5}{4}x + \frac{1}{4} = 0$$

$$\left(\frac{5}{8}\right)^2 - U^2 = \frac{1}{4}$$
$$\frac{25}{64} - U^2 = \frac{1}{4}$$
$$U^2 = \frac{25}{64} - \frac{1}{4} = \frac{25-16}{64} = \frac{9}{64}$$
$$U = \sqrt{\frac{9}{64}} = \pm\frac{3}{8}$$

$$x_1 = \frac{5}{8} + \frac{3}{8} = \frac{8}{8} = 1$$
$$x_2 = \frac{5}{8} - \frac{3}{8} = \frac{2}{8} = \frac{1}{4}$$

$$D = \left\{1\,;\ \frac{1}{4}\right\}$$

Conjunto solución:

$$S = N - D = \left\{0\,;\ 1\,;\ \frac{1}{5}\right\} - \left\{1\,;\ \frac{1}{4}\right\} = \left\{0\,;\ \frac{1}{5}\right\}$$

Ejercicio 104

$$\frac{(x-1)\,(4+2x)\,(x+8)}{(x+4)\,(x+2)} \;=\; 0$$

Conjunto numerador N :

$$x_1 - 1 \;=\; 0$$
$$x_1 \;=\; 1$$

$$4 \;+\; 2x_2 \;=\; 0$$
$$2x_2 \;=\; -4$$
$$x_2 \;=\; -\frac{4}{2} \;=\; -2$$

$$x_3 + 8 \;=\; 0$$
$$x_3 \;=\; -8$$

$$N \;=\; \{1\,;\,-2\,;\,-8\}$$

Conjunto denominador D :

$$x_1 \;=\; -4$$
$$x_2 \;=\; -2$$
$$D \;=\; \{-4\,;\,-2\}$$

Conjunto Solución :

$$S \;=\; N \,-\, D \;=\; \{\,1\,;\,-2\,;\,-8\,\} \,-\, \{\,-4\,;\,-2\,\} \;=\; \{\,1\,;\,-8\,\}$$