

PLANTEL: Universidad Técnica de Ambato

ASIGNATURA: Mat

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CURSO: Seg

FECHA: 02/12/2024

CALIFICACION

TRIMESTRE:

2,00

- Determinar el cociente medio de incrementos de la siguiente función

$$f(x) = \frac{1}{2}x^4 - \frac{5}{3}x^3 + 2x + 5$$

$$\begin{aligned}\Delta x &= x_1 - x_0 \\ &= -\frac{3}{2} - \frac{1}{2} \\ &= -2\end{aligned}$$

$$\frac{1}{2}x_0 - \frac{3}{2}x_1$$

$$\Delta y = f(x_1) - f(x_0)$$

$$f(x_1) = \frac{1}{2}x^4 - \frac{5}{3}x^3 + 2x + 5$$

$$f\left(-\frac{3}{2}\right) = \frac{1}{2}\left(-\frac{3}{2}\right)^4 - \frac{5}{3}\left(-\frac{3}{2}\right)^3 + 2\left(-\frac{3}{2}\right) + 5$$

$$f\left(-\frac{3}{2}\right) = \frac{1}{2}\left(\frac{81}{16}\right) - \frac{5}{3}\left(-\frac{27}{8}\right) - 3 + 5$$

$$= \frac{81}{32} - \frac{121}{24} + 2$$

$$= -\frac{941}{96} + 2$$

$$= -\frac{49}{96}$$

$$f(x_0) = \frac{1}{2}x^4 - \frac{5}{3}x^3 + 2x + 5$$

$$f\left(\frac{1}{2}\right) = \frac{1}{2}\left(\frac{1}{2}\right)^4 - \frac{5}{3}\left(\frac{1}{2}\right)^3 + 2\left(\frac{1}{2}\right) + 5$$

$$= \frac{1}{32} - \frac{1}{40} + 6$$

$$= \frac{961}{160}$$

$$\Delta y = f(x_1) - f(x_0)$$

$$= -\frac{49}{96} + \frac{961}{160}$$

$$= \frac{1319}{240}$$

$$\frac{\Delta y}{\Delta x} = \frac{\frac{1319}{240}}{-2} = \frac{1319}{-480}$$

$$= -\frac{1319}{480}$$