Universidad Central del Ecuador
Facultad de Filosofía, Letras y Ciencias en la Educación
Carrera de Pedagogía de las Ciencias Experimentales Informática

Nombre: Stiven Landázuri, Juan Valle, Jaime Juan de la Cruz

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Taller N° 1.

$F(x) = 3x + 2$

$F'(x) = 3$

$f'(x) = 3$

$f(x) = \int 3 \, dx$

$f(x) = 3x + c$

- $f(x) = 2x^3 + 4x^2 - 5x + 1$

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

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

$f'(x) = 6x^2 + 8x - 5$ ☺

~~Encontrar la antiderivada~~; usando la derivada $f'(x)$ y la condición inicial $f(1) = 2$ encuentra la función $f(x)$ original.

$f'(x) = 6x^2 + 8x - 5$

$f(1) = 2$

$f(x) = \int (6x^2 + 8x - 5) \, dx$

$f(x) = \int 6x^2 \, dx + \int 8x \, dx - \int 5 \, dx$

$f(x) = 6\int x^2 \, dx + 8\int x \, dx - 5\int dx$

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$$f(x) = 6\left(\frac{x^{2+1}}{2+1}\right) + 8\left(\frac{x^{1+1}}{1+1}\right) - 5x$$

$$f(x) = \overset{2}{\cancel{6}}\left(\frac{x^3}{\cancel{3}_1}\right) + \overset{4}{\cancel{8}}\left(\frac{x^2}{\cancel{2}_1}\right) - 5x + c$$

$$f(x) = 2x^3 + 4x^2 - 5x + c$$

$$2 = 2(1)^3 + 4(1)^2 - 5(1) + c$$

$$2 = 2 + 4 - 5 + c$$

$$2 = 1 + c$$

$$2 - 1 = c$$

$$1 = c$$

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

$$f(x) = \frac{1}{4}x^4 - \frac{2}{3}x^3 + 5x^2 - 8x + 3$$

$$f'(x) = \frac{d}{dx}\left(\frac{1}{4}x^4\right) - \frac{d}{dx}\left(\frac{2}{3}x^3\right) + \frac{d}{dx}(5x^2) - \frac{d}{dx}(8x) + \frac{d}{dx}(3)$$

$$f'(x) = \cancel{4}\left(\frac{1}{\cancel{4}}x^{4-1}\right) - \cancel{3}\left(\frac{2}{\cancel{3}}x^{3-1}\right) + 2(5x^{2-1}) - 8$$

$$f'(x) = x^3 - 2x^2 + 10x - 8$$

$$f(x) = x^3 - 2x^2 + 10x - 8$$

$$\int x^3 - 2x^2 + 10x - 8$$

$$\int x^3\,dx - 2\int x^2\,dx + 10\int x\,dx - 8\int dx$$

$$\left(\frac{x^4}{4}\right) - 2\left(\frac{x^3}{3}\right) + 10\left(\frac{x^2}{2}\right) - 8x + c$$

$$\frac{x^4}{4} - 2\frac{x^3}{3} + 5x^2 - 8x + c$$

$$f(9) = 2$$

$$9 = \frac{x^4}{4} - 2\frac{x^3}{3} + 5x^2 - 8x + c$$

$$9 = 2^4 - 2\frac{(2)^3}{3} + 5(2)^2 - 8(2) + c$$

$$9 = \frac{8}{3} + c$$

$$\frac{19}{3} = c$$

$f(x) = 2x^3 + 4x^2 - 5x + C \qquad f(1) = 2$

$2 = 2(1)^3 + 4(1)^2 - 5(1) + C$

$2 = 2 + 4 - 5 + C$

$2 = 1 + C$

$2 - 1 = C$

$1 = C$

$f(x) = 2x^3 + 4x^2 - 5x + 1$

Encontrar la derivada:

$f(x) = \frac{1}{4}x^4 - \frac{2}{3}x^3 + 5x^2 - 8x + 3$

$f'(x) = \frac{d}{dx}\left(\frac{1}{4}x^4\right) - \frac{d}{dx}\left(\frac{2}{3}x^3\right) + \frac{d}{dx}\left(5x^2\right) - \frac{d}{dx}(8x) + \frac{d}{dx}(3)$

$f'(x) = 4\left(\frac{1}{4}x^{4-1}\right) - 3\left(\frac{2}{3}x^{3-1}\right) + 2\left(5x^{2-1}\right) - 8$

$f'(x) = x^3 - 2x^2 + 10x - 8$

2. $f'(x) = x^3 - 2x^2 + 10x - 8$

$= \int (x^3 - 2x^2 + 10x - 8)\, dx$

$= \int x^3\, dx - \int 2x^2 dx - \int 10x\, dx - \int 8\, dx$

$= \frac{x^4}{4} - 2\frac{x^3}{3} + 5x^2 - 8x + C$

3. $f(2) = 2$

$2 = \frac{x^4}{4} - 2\frac{x^3}{3} + 5x^2 - 8x + C$

$2 = \frac{2^4}{4} - 2\frac{(2)^3}{3} + 5(2)^2 - 8(2) + C$

$2 = \frac{8}{3} + C \qquad \frac{10}{3} = C$