

EXAMEN UNIDAD 2

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RECURSOS HUMANOS 6°

1. Deriva las siguientes funciones.

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

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

c)  $f(x) = 12x(3x-2)^5$

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

$$\frac{d}{dx}(x^5 - 2x^3 + 4x^2) = 5x^4 - 6x^2 + 8x$$
$$\frac{d}{dx}(x^5 - 2x^3 + 4x^2)$$
$$= \frac{d}{dx}(x^5) - \frac{d}{dx}(2x^3) + \frac{d}{dx}(4x^2)$$
$$\frac{d}{dx}(x^5) = 5x^4$$
$$\frac{d}{dx}(2x^3) = 6x^2$$
$$\frac{d}{dx}(4x^2) = 8x$$
$$= 5x^4 - 6x^2 + 8x$$

b)  $f(x) = 5x^4 - 3x^3$

$f'(x) = 5(x^4 - 3x^3)$

$5(x^4 - 3x^3) = x$

$5(x^4 - 3x^3) - x = x - x$

$5(x^4 - 3x^3) - x = 0$

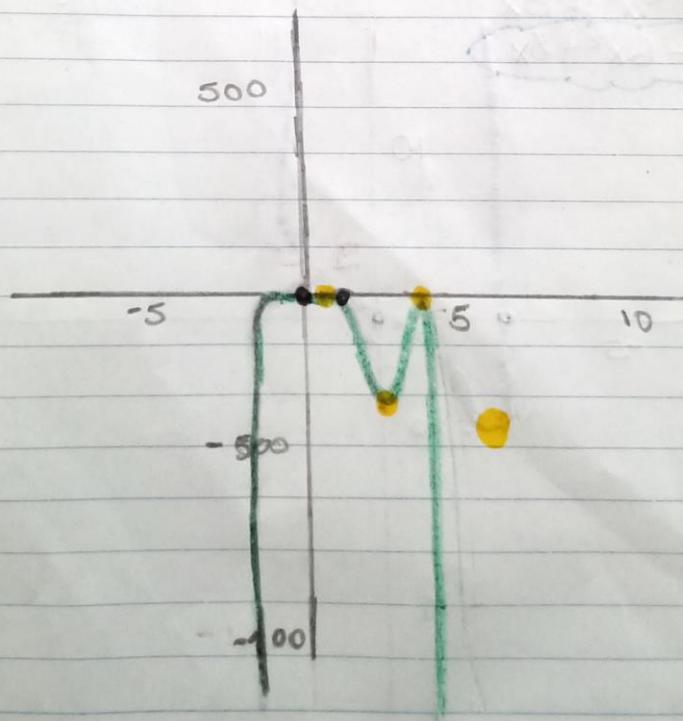
Factorizar  $5(x^4 - 3x^3) - x : x(5x^3(x-3) - 1)$

$x(5x^3(x-3) - 1) = 0$

$x = 0$  or  $5x^3(x-3) - 1 = 0$

$5x^3(x-3) - 1 = 0 : x \approx 0.5$

$x = 0, x \approx 0.50258, x \approx 3.02802, x \approx 2.9705$



$$d) f(x) = 12x(3x-2)^5$$

$$\frac{d}{dx} (12x(3x-2)^5) = 12(3x-2)^5 + 15x(3x-2)^4$$

$$\frac{d}{dx} (12x(3x-2)^5)$$

$$= 12 \frac{d}{dx} (x(3x-2)^5)$$

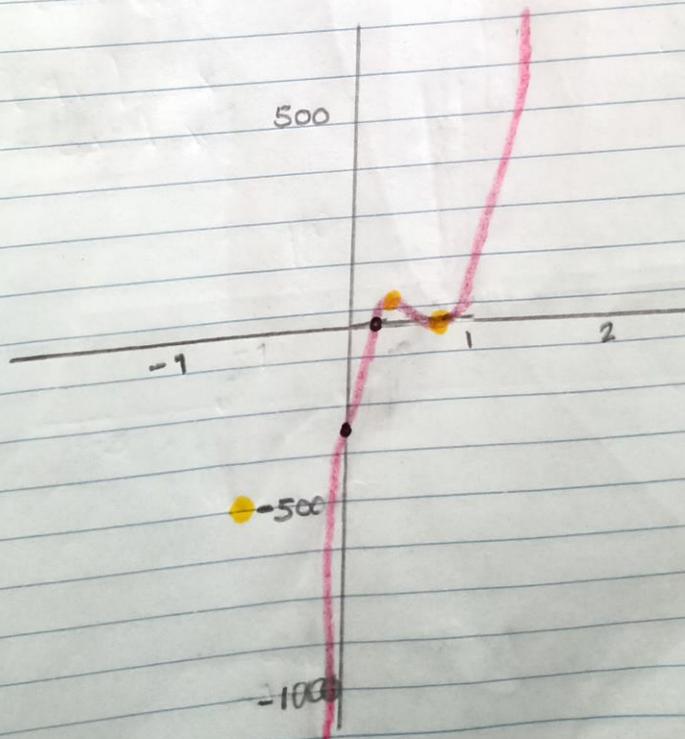
$$= 12 \left( \frac{d}{dx} (x) (3x-2)^5 + \frac{d}{dx} ((3x-2)^5) x \right)$$

$$\frac{d}{dx} (x) = 1$$

$$\frac{d}{dx} ((3x-2)^5) = 15(3x-2)^4$$

$$= 12(1 \cdot (3x-2)^5) + 15(3x-2)^4 x$$

$$= 12(3x-2)^5 + 15x(3x-2)^4$$



Resuelve los siguientes integrales.

a)  $\int (26x^3 + 20x^2 + 25x - 5x) dx$

b)  $\int (2x+10)^3 dx$

c)  $\int (13-10)^4 dx$

a)  $\int (26x^3 + 20x^2 + 25x - 5x) dx$

$$\int 26x^3 + 20x^2 + 25x - 5x dx = \frac{13x^4}{2} + \frac{20x^3}{3} + \frac{25x^2}{2} - \frac{5x^2}{2} + C$$

$$\int 26x^3 + 20x^2 + 25x - 5x dx$$

$$= \int 26x^3 dx + \int 20x^2 dx + \int 25x dx - \int 5x dx$$

$$\int 26x^3 dx = \frac{13x^4}{2}$$

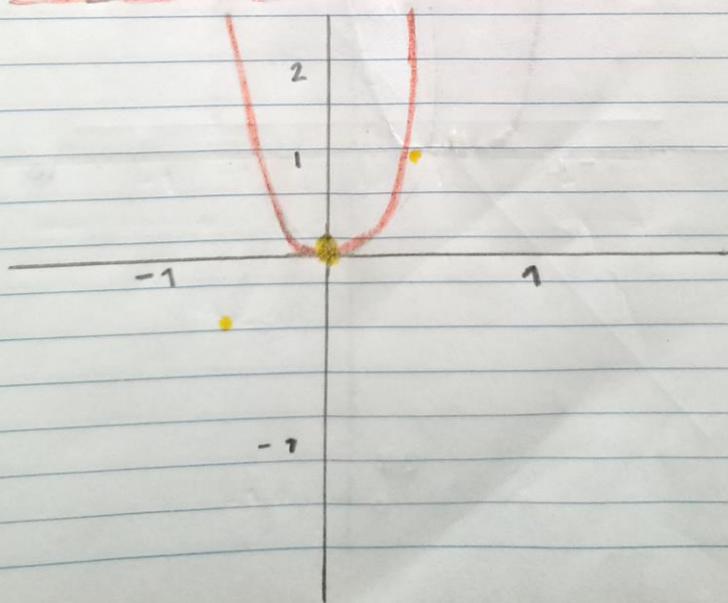
$$\int 20x^2 dx = \frac{20x^3}{3}$$

$$\int 25x dx = \frac{25x^2}{2}$$

$$\int 5x dx = \frac{5x^2}{2}$$

$$= \frac{13x^4}{2} + \frac{20x^3}{3} + \frac{25x^2}{2} - \frac{5x^2}{2}$$

$$= \frac{13x^4}{2} + \frac{20x^3}{3} + \frac{25x^2}{2} - \frac{5x^2}{2} + C$$



$$b) \int (2x+10)^3 dx$$

$$\int (2x+10)^3 dx = \frac{1}{8} (2x+10)^4 + C$$

$$\int (2x+10)^3 dx$$

$$u = 2x+10$$

$$= \int \frac{u^3}{2} du$$

$$= \frac{1}{2} \cdot \int u^3 du$$

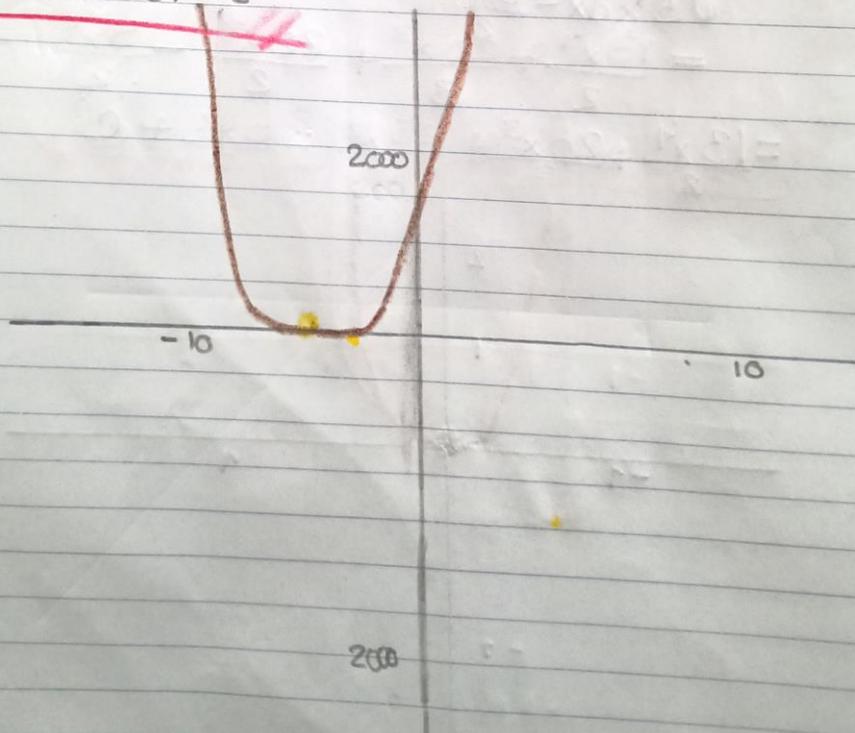
$$= \frac{1}{2} \cdot \frac{u^3+1}{3+1}$$

$$= \frac{1}{2} \cdot \frac{(2x+10)^{3+1}}{3+1}$$

$$\frac{1}{2} \cdot \frac{(2x+10)^{3+1}}{3+1} = \frac{1}{8} (2x+10)^4$$

$$= \frac{1}{8} (2x+10)^4$$

$$= \frac{1}{8} (2x+10)^4 + C$$



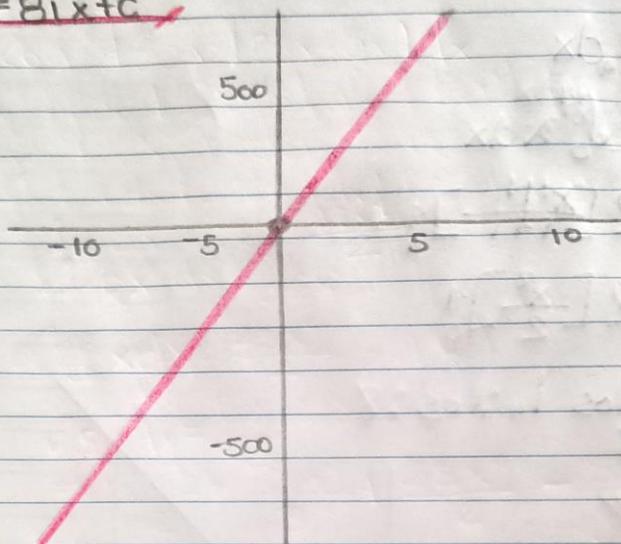
$$c) \int (13 - 10)^4 dx$$

$$= (13 - 10)^4 x$$

$$= 81x$$

$$= 81x + c$$

$$= \underline{81x + c}$$



Calcula el valor de la integral definida de la siguiente función por medio de la observación de su gráfica (gráfica la función con el intervalo definido)

$$\begin{aligned} \int_0^4 2x \, dx \\ &= 2 \cdot \int_0^4 x \, dx \\ &= 2 \left[ \frac{x^{1+1}}{1+1} \right]_0^4 \\ &= 2 \left[ \frac{x^2}{2} \right]_0^4 \end{aligned}$$

Calcular los límites: 8

$$\begin{aligned} &= 2 \cdot 8 \\ &= \underline{\underline{16}} \end{aligned}$$

