



Universidad del Sureste  
Campus Comitán  
Licenciatura en Medicina Humana

Derivadas

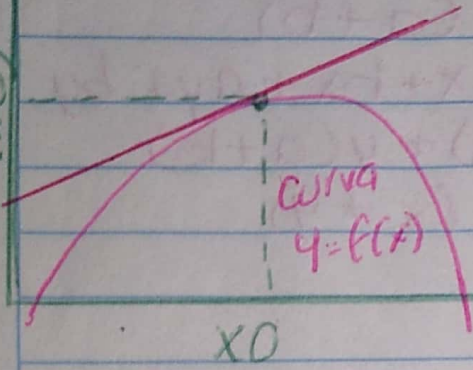
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2do "B"

PASIÓN POR EDUCAR

Biomatemáticas  
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Comitán de Domínguez, Chiapas a 19 de marzo del 2022.

# Derivadas



Derivada de la función en el punto marcado es equivalente a la pendiente de la recta de la tangente.

Hb  $\rightarrow$  V. independiente  
Hto  $\rightarrow$  V. dependiente.

## Reglas de la derivación

Función	Derivada
1: $f(x) = c$	$f'(x) = 0$
2: $f(x) = x^n$	$f'(x) = n x^{n-1}$ $x^2 = 3x^2$
3: $f(x) = c f(x)$	$f'(x) = c f'(x)$ $f(x) = 3x^5$ $3(5x^4)$ $15x^4$
4: $f(x) = f(x) + g(x)$	$f(x) = f' \pm g'$
5: <del>...</del>	<del>...</del>
5: $f(x) = (f+g)$	$f'(x) = fg' + f'g$ $(4x^2+x) + (5x^2-x)$ $(10x-1)(4x^2+x) + 0x+1(5x^2-x)$
6: $f(x) = \left(\frac{f(x)}{g(x)}\right)$	$f'(x) = \frac{f'g - fg'}{g^2}$



# Derivadas Ejercicios

1- $x^7$	$7x^6$
2- $x^{10}$	$10x^9$
3- $x^{20}$	$20x^{19}$
4- $x^2$	$2x$
5- $x^4$	$4x^3$

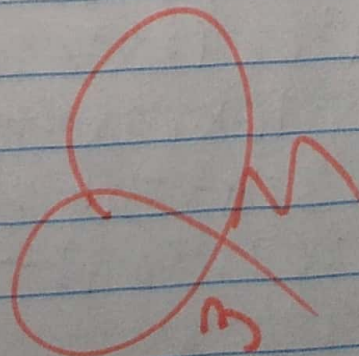
✓ 2da Derivada

1- $7x^6$	$7(6x^5) = 42x^5$
2- $8x^2$	$8(2x) = 16x$
3- $6x$	$6(x) = 6$
4- $2x^3$	$2(3x^2) = 6x^2$
5- $9x^4$	$9(4x^3) = 36x^3$

3ra Derivada

1- $4x^3 + 6x^2$	$12x^2 + 12x$
2- $x^4 + x^3$	$4x^3 + 3x^2$
3- $2x^2 - 8x$	$4x - 8$
4- $7x^3 - 5x^5$	$21x^2 - 25x^4$
5- $10x^2 + 2x$	$20x + 2$

4ta Derivada



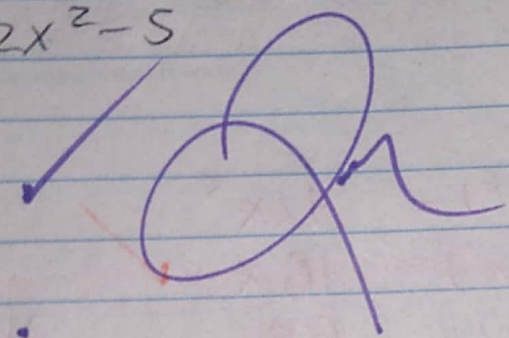


# TAREA

17-marzo-22

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

- 1-  $6x$
- 2-  $0$
- 3-  $-2$
- 4-  $-2$
- 5-  $-1x$



# EJERCICIOS

- 1-  $(4x+1) + (10x^2 - 5) = 20x - 5(4x+1) + 4 + 0(10x^2 - 5)$
- 2-  $(3x^3 + 2x) + (6x^4 + 6)$
- 3-  $(2x^4 + x^3) + (5x^3 - 8x^2)$
- 4-  $(32x - 2) - (6x - 1)$
- 5-  $(7x^2 + 7) + (2x - 3)$

- 1-  $20x - 5(4x+1) + 4 + 0(10x^2 - 5)$
- 2-  $24x^3 + (3x^3 + 2x) + 9x^2 + 2 + (6x^4 + 6)$
- 3-  $15x^2 - 16x + (2x^4 + x^3) + 8x^3 + 3x^2(2x^4 + x^3)$
- 4-  $6 + (32x - 2) + 32 - (6x - 1)$
- 5-  $2 + (7x^2 + 7) + 14x - (2x - 3)$



6- Ejemplo.

$$f(x) = \frac{4x-5}{10x^2-5}$$

$$f'(x) = \frac{20x(4x-5) - 4(10x^2-5)}{(10x^2-5)^2}$$

## EJERCICIOS

$$1- f(x) = \frac{5x^2 + 4x}{6x^3} = \frac{18x^2(5x^2) + 10x + 4(6x^3)}{(6x^3)^2}$$

$$2- f(x) = \frac{3x^5 - 7x^4}{2x} = \frac{2(3x^3 - 7x^4) - 15x^2 - 28x^3(2x)}{(2x)^2}$$

$$3- f(x) = \frac{10x^2 + 5x}{15x - 2} = \frac{15(10x^2 + 5x) - 20x + 3(15x - 2)}{(15x - 2)^2}$$

$$4- f(x) = \frac{2x^{10}}{2x^5} = \frac{10x^4(2x^{10}) - 20x^9(2x^5)}{(2x^5)^2}$$

$$5- f(x) = \frac{58x}{60x} = \frac{60(58x) - 58(60x)}{(60x)^2}$$



# Teorema: La derivada de la potencia entera de la función $f(x)$

sea  $y = [f(x)]^n$  entonces  
 $y' = n [f(x)]^{n-1} f'(x)$

$$f(x) = (2x + 3)^3$$

$$y = (3)(2x + 3)^{3-1} (2)$$

$$y' = (3)(2x + 3)^2 (2)$$

$$y = 6(2x + 3)^2$$

## EJERCICIOS

1-  $y' = (6x^3 - 5x^2 + 4)^3$

2-  $y' = (5x^2 + 10x)^2$

3-  $y' = (7x^2 - 2x^2 + 5)^4$

4-  $y' = (2x^{10} - 2x^5)^5$

5-  $y' = (3x^3 - 2x^2)^6$

1-  $y' = (3)(6x^3 - 5x^2 + 4)^2 (18x^2 - 10x)$

$y = (3)(6x^3 - 5x^2 + 4)^3 (34x^2 - 30x)$

$y = 54x - 30x(6x^3 - 5x^2 + 4)^3$

2-  $y' = (2)(5x^2 + 10x)^1 (10x + 10)$

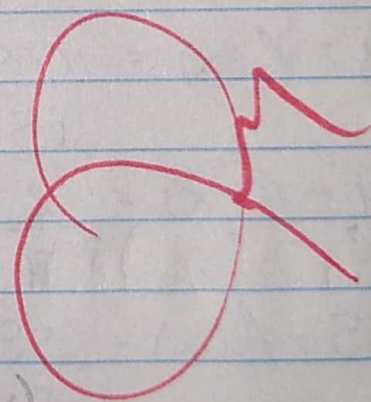
$y = 20x + 20(5x^2 + 10x) = 10x + 10$

3-  $y' = (4)(7x^2 - 2x^2 + 5)^3 (14x - 4x)$

$y = 56x - 8x(7x^2 - 2x^2 + 5)^3$

4-  $y' = (6)(2x^{10} - 2x^5)^4 (20x^9 - 10x^4)$

$y' = 120x^9 - 60x^4(2x^{10} - 2x^5)$



$$5 = (6)(3x^3 - 2x^2)^5 (9x^2 - 2x)$$

$$4 = 54x^2 - 12x(3x^3 - 2x^2)^5$$