Actividad: ¡A derivar se ha dicho!

Materia: Biomatematicas

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Grado: 2°

Grupo: “C”

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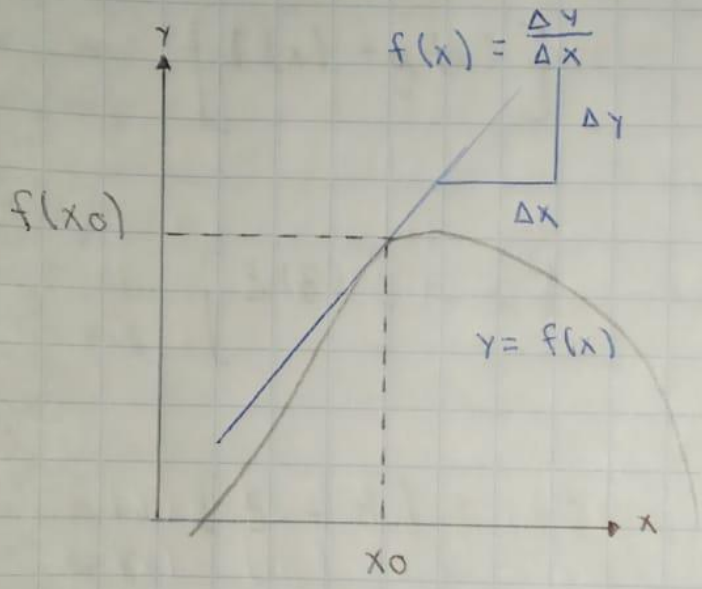
Martín Mar 15/03/22

Unidad II 1

Derivadas

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



- Variable dependiente
- Variable independiente

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Reglas de la derivación

1: $f(x) = C$
$f'(x) = 0$

$f(x) = 7$
$f'(x) = 0$

2: $f(x) = x^n$
$f'(x) = nx^{n-1}$

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

3: $f(x) = Cx$
$f'(x) = cf(x) = cf'(x)$

$f(x) = 3x^5$
$f'(x) = 15x^4$

4: $f(x) = f \pm g$
$f'(x) = (f \pm g)' = f' \pm g'$

$f(x) = 2x^3 + x$
$f'(x) = 2(3x^2) + 1$
$f'(x) = 6x^2 + 1$

5: $f(x) = fg + fg$
$f'(x) = (fg)' = fg' \pm fg'$

$f(x) = (4x+1) + (10x^2 - 5)$
$f'(x) = 20x(4x+1) + 4(10x^2 - 5)$

6: $f(x) = \left[\frac{F}{g}\right]$

$f'(x) = \frac{f'g - fg'}{g^2}$

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

$\frac{[10x + 3(4x - 5) - 4(5x^2 + 3x)]}{(5x^2 + 3x)^2}$

Reglas de la derivación

1. $f(x) = C$ $\quad f(x) = 7$
   $f'(x) = 0$ $\quad f'(x) = 0$

2. $f x = x^n$ $\quad f(x) = x^5$
   $f'(x) = n\,x^{n-1}$ $\quad f'(x) = 5x^4$

3. $f(x) = C\,x$ $\quad f(x) = 3x^5$
   $f'(x) = C f(x) = C f'(x)$ $\quad f'(x) = 15x^4$

4. $f(x) = f \pm g$ $\quad f(x) = 2x^3 + x$
   $f'(x) = (f \pm g)' = f' \pm g'$ $\quad f'(x) = 2(3x^2) + 1$
   $f'(x) = 6x^2 + 1$

1) x^3 $\quad f(x) = x^3 = f'(x) = 3x^2$
2) x^2 $\quad f(x) = x^2 = f'(x) = 2x$
3) x^8 $\quad f(x) = x^8 = f'(x) = 8x^7$
4) x^{11} $\quad f(x) = x^{11} = f'(x) = 4x^{10}$
5) x^{20} $\quad f(x) = x^{20} = f'(x) = 20x^{19}$

1) $4x^3$ $\quad f(x) = 4x^3 = f'(x) = 4(3x^3) = 12x^2$
2) $5x^6$ $\quad f(x) = 5x^6 = f'(x) = 5(6x^5) = 30x^5$
3) $2x$ $\quad f(x) = 2x = f'(x) = 2(x) = 2$
4) $3x^3$ $\quad f(x) = 3x^3 = f'(x) = 3(3x^2) = 9x^2$
5) $8x^2$ $\quad f(x) = 8x^2 = f'(x) = 8(2x) = 16x$

4: $f(x) = f \pm g$

$f'(x) = (F \pm g)' = f' \pm g'$

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

$f'(x) = 2(3x^2) + 1$

$f'(x) = 6x^2 + 1$

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

2) $6x - 2 = f'(x) = 6$

3) $5x^5 + x^2 = f'(x) = 25x^4 + 2x$ ✓

4) $7x^2 + x = f'(x) = 14x + 1$

5) $9x^3 - 4x = f'(x) = 27x^3 - 4$

5: $f(x) = fg \pm fg$

$f'(x) = (fg)' = fg' \pm fg'$

$f(x) = (4x+1) + (10x^2 - 5)$

$f'(x) = 20x(4x+1) + 4(10x^2 - 5)$

1) $(4x^3 - 2) - (6x^2 + 2)$

$12x(4x^3 - 2) - 12x^2(6x^2 + 2)$

2) $(3x^5 + 5x) + (7x - 3)$

$7(3x^5 + 5x) + 15x^4 + 5(7x - 3)$

3) $(5x^2 - 6) + (8x^3 + 4)$

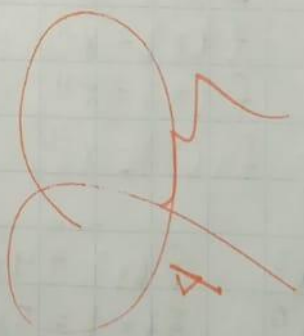
$24x^2(5x^2 - 6) + 10x(8x^3 + 4)$

4) $(2x^5 - 3x) - (6x - 1)$

$6(2x^5 - 3x) - 10x^4 - 3(6x - 1)$

5) $(7x^3 + 7) + (7x^3 - 7)$

$21x^2(7x^3 + 7) + 21x^2(7x^3 - 7)$



6.

1) $\frac{6x^3+4}{2x^2+3x} = \frac{[4x+3(6x^3+4) - 18x^2(2x^2+3x)]}{(2x^3+3x)^2}$

2) $\frac{5x^5-2x^4}{3x^3-x^2} = \frac{[9x^2+2x(5x^5-2x^4) - 25x^4 - 8x^3(3x^3-x^2)]}{(3x^3-x^2)^2}$

3) $\frac{4x^4+3x^3}{3x^2+x} \quad \frac{[4x+1(4x^4+3x^3) - 16x^3+9x^2(2x^2+x)]}{(2x^2+x)}$

4) $\frac{8x^2-3}{7x} \quad \frac{[7(8x^2-3) - 16x(7x)]}{(7x)^2}$

5) $\frac{x^7}{2x^3} \quad \frac{(6x^2(x^7) - 7x^6(2x^3))}{(2x^3)^2}$

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EJERCICIOS

1: $F(x) = 3x^2$ Formula: $F(x) = x^n$
$F'(x) = nx^{n-1}$

$F(x) = 3x^2$
$F'(x) = 6x$

2: $F(x) = 5$
Fórmula: $F(x) = C$ $F(x) = 5$
$F'(x) = \emptyset$ $F'(x) = \underline{\emptyset}$

3: $F(x) = -2x$
Fórmula: $F(x) = -2x$
$F'(x) = \underline{-2}$

4: $F(x) = -2x^2 - 5$
Fórmula: $F(x) = x^n$ $F(x) = -2x^2 - 5$
$F'(x) = nx^{n-1}$ $F'(x) = \underline{-4x}$

5: $F(x) = 2x^4 + x^3 - x^2 - 4$
Fórmula: $F(x) = x^n$ $F(x) = 2x^4 + x^3 - x^2 - 4$
$F'(x) = nx^{n-1}$ $F'(x) = 8x^3 + 3x^2 - 2x$

6: $F(x) = 4x^3 + 6x$
Fórmula: $F(x) = x^n$ $F(x) = 4x^3 + 6x$
$F'(x) = nx^{n-1}$ $F'(x) = \underline{12x^2 + 6}$

7: $F(x) = 8x^6$
Fórmula: $F(x) = x^n$ $F(x) = 8x^6$
$F'(x) = nx^{n-1}$ $F'(x) = \underline{48x^5}$

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8: $F(x) = 8$

Fórmula: $F(x) = C$ $F(x) = 8$

$F'(x) = 0$ $F'(x) = 0$

9: $F(x) = (3x^3 + 2x) + (6x^4 + 6)$

Fórmula: $F(x) = Fg + Fg$

$F'(x) = (Fg)' = Fg' \pm Fg'$

$F(x) = (3x^3 + 2x) + (6x^4 + 6)$

$F'(x) = 24x^3 (3x^3 + 2x) + 9x^2 + 2 (6x^4 + 6)$

10: $F(x) = \dfrac{8x^6 - 6x^3 - 4}{2x^4}$

Fórmula: $F(x) = \left[\dfrac{F}{g}\right]$

$F'(x) = \dfrac{f'g - fg'}{g^2}$

$F(x) = \dfrac{8x^6 - 6x^3 - 4}{2x^4}$

$F'(x) = \dfrac{[8x^3 (8x^6 - 6x^3 - 4)] - [(48x^5 - 18x^2)(2x^4)}{(2x^4)^2}$

11: $F(x) (7x^2 + 4x) + (6x^3 - 2x^2)$

Fórmula: $F(x) = Fg + Fg$

$F'(x) = (Fg)' = Fg' \pm Fg'$

$F(x) = (7x^2 + 4x) + (6x^3 - 2x^2)$

$F'(x) = 18x^2 - 4x (7x^2 + 4x) + 14x + 4 (6x^3 - 2x^2)$

12; $F(x) = (3x^5 + 6) - (8x^2 - 2x)$

Fórmula: $F(x) = Fg \pm Fg$

$F'(x) = (Fg)' = Fg' \pm Fg'$

$F(x) = (3x^5 + 6) - (8x^3 + 2x)$

$F'(x) = [16x - 2(3x^5 + 6)] - [15x^4 (8x^2 - 2x)]$

13; $F(x) = F(x) = \dfrac{2x^3 - x^2}{6x^2 + x + 2}$

Fórmula $= F(x) = \left[\dfrac{F}{g}\right]$

$$F'(x) = \frac{F'g - Fg'}{g^2}$$

$$F(x) = \frac{2x^3 - x^2}{6x^2 + x + 2}$$

$$F'(x) = \frac{(12x + 1)(2x^3 - x^2) - (6x^2 - 2)(6x^2 + x + 2)}{(6x^2 + x + 2)^2}$$

14; $F(x) = (6x^4 + 2x^5) - (2x^6 + x^5)$

Fórmula: $F(x) = Fg \pm Fg$

$F'(x) = (Fg)' = Fg' \pm Fg'$

$F(x) = (6x^4 + 2x^5) - (2x^6 + x^5)$

$F'(x) = [12x^5 + 5x^4 (6x^4 + 2x^5)] - [24x^3 + 10x^4 (2x^6 + x^5)]$

15: $F(x) = 78$

Fórmula: $F(x) = C$

$F'(x) = 0$

$F(x) = 78$

$F'(x) = \underline{0}$