

EJERCICIOS DE LIMITES

RECUPERACION DE MATEMATICAS
GRADO 11 2009

$$\lim_{x \rightarrow \infty} \left(\sqrt{18x^2 + 1} \frac{1}{\sqrt{32x^2 - 3}} \right)$$

$$\lim_{x \rightarrow 0} \frac{(1+x)^2 - 1}{x}$$

$$\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 - 5x + 6}$$

$$\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x - 3}$$

$$\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x+2} \right)^{x-1}$$

$$\lim_{x \rightarrow \infty} \left(1 - \frac{2}{3x} \right)^x$$

$$\lim_{x \rightarrow \infty} \left(\sqrt{x^2 + 3x} - \sqrt{x^2 + x} \right)$$

$$\lim_{x \rightarrow \infty} \left(\frac{x^2}{x-1} - \frac{x^2+1}{x-2} \right)$$

$$\lim_{x \rightarrow \infty} \frac{7x-1}{\sqrt[3]{5x^3+4x-2}}$$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{4x^4+x^2+1}}{x^2+1}$$

$$\lim_{x \rightarrow \infty} \frac{(x^2+1)^2 - 3x^2 + 3}{x^3 - 5}$$

$$\lim_{x \rightarrow \infty} \frac{\log(x^8 - 5)}{x^2}$$

$$\lim_{x \rightarrow \infty} \frac{3^x - 1}{\sqrt{x^7 + x^5}}$$

$$\lim_{x \rightarrow \infty} \frac{x^7 + x^5 + x^3}{\left(\frac{1}{2}\right)^x}$$

$$\lim_{x \rightarrow 0} \frac{2}{3 + 4^{\frac{1}{x}}}$$

$$\lim_{x \rightarrow 5} \frac{x^2 - 13x + 40}{x^2 - 21x + 80} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 + x - 20}{x^2 - 17x + 52} =$$

$$\lim_{x \rightarrow -4} \frac{x^2 - 6x - 40}{x^2 + 16x + 48} =$$

$$\lim_{x \rightarrow -9} \frac{x^2 + 18x + 81}{x^2 + 7x - 18} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 + 10x + 9}{x^2 + 10x + 9} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 - 9x - 10}{x^2 - 6x - 7} =$$

$$\lim_{x \rightarrow -7} \frac{x^2 + x - 42}{x^2 + 5x - 14} =$$

$$\lim_{x \rightarrow 6} \frac{x^2 - 11x + 30}{x^2 - 16x + 60} =$$

$$\lim_{x \rightarrow -9} \frac{x^2 + 11x + 18}{x^2 + 22x + 117} =$$

$$\lim_{x \rightarrow -10} \frac{x^2 + 3x - 70}{x^2 + 29x + 190} =$$

$$\lim_{x \rightarrow 7} \frac{x^2 - 16x + 63}{x^2 - 7x} =$$

$$\lim_{x \rightarrow -9} \frac{x^2 - 81}{x^2 + 27x + 162} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 + 6x - 40}{x^2 + 3x - 28} =$$

$$\lim_{x \rightarrow 1} \frac{x^2 - 8x + 7}{x^2 + 8x - 9} =$$

$$\lim_{x \rightarrow 6} \frac{x^2 - 36}{x^2 - 23x + 102} =$$

$$\lim_{x \rightarrow 8} \frac{x^2 - 2x - 48}{x^2 - 10x + 16} =$$

$$\lim_{x \rightarrow 8} \frac{x^2 + 2x - 80}{x^2 - 13x + 40} =$$

ercicio 2

$$\lim_{x \rightarrow -2} \frac{x^2 + 9x + 14}{x^2 + 9x + 14} =$$

$$\lim_{x \rightarrow 9} \frac{x^2 - x - 72}{x^2 - 13x + 36} =$$

$$\lim_{x \rightarrow 2} \frac{x^2 - 3x + 2}{x^2 - 15x + 26} =$$

$$\lim_{x \rightarrow -5} \frac{x^2 + 3x - 10}{x^2 - 25} =$$

$$\lim_{x \rightarrow 8} \frac{x^2 - 18x + 80}{x^2 - 19x + 88} =$$

$$\lim_{x \rightarrow -7} \frac{x^2 + 14x + 49}{x^2 + 8x + 7} =$$

$$\lim_{x \rightarrow -2} \frac{x^2 - 8x - 20}{x^2 - 3x - 10} =$$

$$\lim_{x \rightarrow -6} \frac{x^2 + 4x - 12}{x^2 + 22x + 96} =$$

$$\lim_{x \rightarrow -6} \frac{x^2 + x - 30}{x^2 + 8x + 12} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 + 10x + 9}{x^2 + 13x + 12} =$$

$$\lim_{x \rightarrow 10} \frac{x^2 - 4x - 60}{x^2 - 28x + 180} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 - 14x + 40}{x^2 + 3x - 28} =$$

$$\lim_{x \rightarrow -4} \frac{x^2 + 10x + 24}{x^2 + 5x + 4} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 + 8x + 7}{x^2 - 5x - 6} =$$

$$\lim_{x \rightarrow 2} \frac{x^2 - 10x + 16}{x^2 - 7x + 10} =$$

$$\lim_{x \rightarrow -10} \frac{x^2 + 19x + 90}{x^2 + 26x + 160} =$$

$$\lim_{x \rightarrow 1} \frac{x^2 - 3x + 2}{x^2 - 11x + 10} =$$

$$\lim_{x \rightarrow -3} \frac{x^2 - x - 12}{x^2 - x - 12} =$$

$$\lim_{x \rightarrow 6} \frac{x^2 - 16x + 60}{x^2 - 14x + 48} =$$

$$\lim_{x \rightarrow -7} \frac{x^2 + 14x + 49}{x^2 + 3x - 28} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 - 1}{x^2 - 6x - 7} =$$

$$\lim_{x \rightarrow -3} \frac{x^2 + 9x + 18}{x^2 - 2x - 15} =$$

rcicio 3

$$\lim_{x \rightarrow -9} \frac{x^2 + 6x - 27}{x^2 + 29x + 180} =$$

$$\lim_{x \rightarrow 1} \frac{x^2 + 5x - 6}{x^2 + 2x - 3} =$$

$$\lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x^2 + 2x - 8} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 + 5x - 36}{x^2 - 15x + 44} =$$

$$\lim_{x \rightarrow 9} \frac{x^2 - 3x - 54}{x^2 - 11x + 18} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 - 16}{x^2 + x - 20} =$$

$$\lim_{x \rightarrow 10} \frac{x^2 - 5x - 50}{x^2 - 24x + 140} =$$

$$\lim_{x \rightarrow -8} \frac{x^2 - 2x - 80}{x^2 + 26x + 144} =$$

$$\lim_{x \rightarrow -8} \frac{x^2 + 14x + 48}{x^2 + 9x + 8} =$$

$$\lim_{x \rightarrow 8} \frac{x^2 - 7x - 8}{x^2 - 10x + 16} =$$

$$\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x^2 + 6x - 7} =$$

$$\lim_{x \rightarrow 6} \frac{x^2 - 9x + 18}{x^2 - 19x + 78} =$$

$$\lim_{x \rightarrow 5} \frac{x^2 + 4x - 45}{x^2 - 21x + 80} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 + 4x + 3}{x^2 + 5x + 4} =$$

$$\lim_{x \rightarrow -4} \frac{x^2 + x - 12}{x^2 + 5x + 4} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 + 4x - 32}{x^2 - 5x + 4} =$$

$$\lim_{x \rightarrow -4} \frac{x^2 - 5x - 36}{x^2 + x - 12} =$$

$$\lim_{x \rightarrow 4} \frac{x^2 - 5x + 4}{x^2 + 2x - 24} =$$

$$\lim_{x \rightarrow -4} \frac{x^2 + 3x - 4}{x^2 - x - 20} =$$

$$\lim_{x \rightarrow -4} \frac{x^2 + 11x + 28}{x^2 + 3x - 4} =$$

$$\lim_{x \rightarrow -1} \frac{x^2 - 4x - 5}{x^2 - 9x - 10} =$$

EJERCICIOS DE DERIVADAS UTILIZANDO LIMITE

PRIMERA DERIVADA

$$y = 8x$$

$$y = 2x$$

$$y = 11x$$

$$y = 10x$$

$$y = 13x$$

$$y = 14x$$

$$y = 15x$$

$$y = 15x$$

$$y = 8x$$

$$y = 8x$$

$$y = 10x$$

$$y = 8x$$

$$y = 4x$$

$$y = 11x$$

$$y = 7x$$

$$y = 28x^2$$

$$y = 15x^2$$

$$y = 24x^2$$

$$y = 16x^2$$

$$y = 32x^2$$

$$y = 29x^2$$

$$y = 20x^2$$

$$y = 33x^2$$

$$y = 13x^2$$

$$y = 23x^2$$

$$y = 26x^2$$

$$y = 14x^2$$

$$y = 21x^2$$

$$y = 23x^2$$

$$y = 13x^2$$

EJERCICIOS DE DERIVADAS UTILIZANDO LIMITE

PRIMERA DERIVADA

$$y = -12x^3 - 28x^2 - 8x - 7$$

$$y = -9x^3 + 15x^2 - 2x - 4$$

$$y = 7x^3 - 24x^2 + 11x - 5$$

$$y = 6x^3 - 16x^2 - 10x - 10$$

$$y = 11x^3 + 32x^2 - 13x - 7$$

$$y = 15x^3 - 29x^2 - 14x + 8$$

$$y = 3x^3 - 20x^2 + 15x + 8$$

$$y = -12x^3 + 33x^2 - 15x + 13$$

$$y = -2x^3 + 13x^2 - 8x - 6$$

$$y = -12x^3 - 23x^2 + 8x + 4$$

$$y = -7x^3 + 26x^2 - 10x + 13$$

$$y = 5x^3 - 14x^2 + 8x - 10$$

$$y = -14x^3 + 21x^2 - 4x - 2$$

$$y = -11x^3 + 23x^2 + 11x - 2$$

$$y = 2x^3 + 13x^2 - 7x + 14$$

SEGUNDA DERIVADA

$$y = -12x^3 - 28x^2 - 8x - 7$$

$$y = -9x^3 + 15x^2 - 2x - 4$$

$$y = 7x^3 - 24x^2 + 11x - 5$$

$$y = 6x^3 - 16x^2 - 10x - 10$$

$$y = 11x^3 + 32x^2 - 13x - 7$$

$$y = 15x^3 - 29x^2 - 14x + 8$$

$$y = 3x^3 - 20x^2 + 15x + 8$$

$$y = -12x^3 + 33x^2 - 15x + 13$$

$$y = -2x^3 + 13x^2 - 8x - 6$$

$$y = -12x^3 - 23x^2 + 8x + 4$$

$$y = -7x^3 + 26x^2 - 10x + 13$$

$$y = 5x^3 - 14x^2 + 8x - 10$$

$$y = -14x^3 + 21x^2 - 4x - 2$$

$$y = -11x^3 + 23x^2 + 11x - 2$$

$$y = 2x^3 + 13x^2 - 7x + 14$$

DERIVADAS

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

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

$$f(x) = \sqrt{1 - x^2}$$

$$f(x) = \frac{1}{\sqrt[3]{(x^3 - 2)^2}}$$

$$f(x) = (5 - 3 \cos x)^4$$

$$f(x) = \frac{1}{\arctan x}$$

$$f(x) = \frac{1}{3 \cos^3 x} - \frac{1}{\cos x}$$

$$f(x) = (1 + \sin 5x)^4$$

$$f(x) = \sqrt[3]{2^x + x}$$

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

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

$$f(x) = \sqrt[3]{2 + 5x^2}$$

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

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

$$f(x) = \sin^3 x - \cos^3 x$$

$$f(x) = \sin(x^2)$$

$$f(x) = \sqrt{x e^x + x}$$

$$f(x) = \ln(\ln x)$$

Calcula las derivadas 1ª, 2ª, 3ª y 4ª de:

$$f(x) = 2x^3 - 15x^2 + 36x - 12$$

Ejercicios

En los siguientes ejercicios obtenga la derivada de la función que se indica aplicando la regla de la cadena:

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

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

$$f(x) = (x^2 + 4)^{-2}$$

$$f(x) = \text{sen } x^2$$

$$f(x) = (\text{sen } x)^2$$

1 $f(x) = \frac{5}{x^5}$

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

3 $f(x) = \sqrt{x}$

4 $f(x) = \frac{1}{\sqrt{x}}$

5 $f(x) = \frac{1}{x\sqrt{x}}$

6 $f(x) = \sqrt[3]{x^2} + \sqrt{x}$

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

Calcula mediante la fórmula de la derivada de una raíz:

1 $f(x) = \sqrt{x^2 - 2x + 3}$

2 $f(x) = \sqrt[4]{x^5 - x^3 - 2}$

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

Deriva las funciones exponenciales

1 $f(x) = 10^{\sqrt{x}}$

2 $f(x) = e^{3-x^2}$

3 $f(x) = \frac{e^x + e^{-x}}{2}$

4 $f(x) = 3^{2x^2} \cdot \sqrt{x}$

5 $f(x) = \frac{e^{2x}}{x^2}$

Calcula la derivada de la funciones logarítmicas:

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

2 $f(x) = \ln\left(\frac{e^x + 1}{e^x - 1}\right)$

3 $f(x) = \log\sqrt{\frac{1+x}{1-x}}$

4 $f(x) = \ln\sqrt{x(1-x)}$

5 $f(x) = \ln\sqrt[3]{\frac{3x}{x+2}}$

Hallar las derivadas de las funciones siguientes:

a) $f_1(x) = (x + 1)^6$ b) $f_2(x) = (2x - 5)^{1/2}$ c) $f_3(x) = (2x^2 + 3)^3$

d) $f_4(x) = \frac{1}{(3x - 4)^3}$ e) $f_5(x) = \cos(\operatorname{sen} 5x)$ f) $f_6(x) = \operatorname{sen}(x^2 + 5x)$

g) $f_7(x) = \frac{1}{\operatorname{sen} x + \operatorname{cos} x}$ h) $f_8(x) = \sqrt{(x + 1)^5}$ i) $f_9(x) = \frac{\operatorname{sen} 2\pi x}{\operatorname{cos} 3x}$

j) $f_{10}(x) = \cos((x + 1)^6)$ k) $f_{11}(x) = \operatorname{tg} (2x^2 + \pi)^3$

$f_{12}(x) = \operatorname{sen}^2(3x) - \cos(3x^3 + 5x)$

Hallar la segunda derivada de

a) $f(x) = 3x^3 + 5x - 3$ b) $g(x) = (x^2 + 2)^5$ c) $s(z) = \cos(z^2 - 2)$