

de fuerza Hoyaka #1

Fecha: 19-03-2023

Ley de la potencia

① $f(x) = x^5$

$f'(x) = 5x //$

② $f(x) = 3x^{11}$

$f'(x) = 21x^{10} //$

Regla de la constante

Si $f(x) = c$ es constante, entonces $f'(x) = 0$

① $f(x) = 7$

Regla de la suma

Si $f(x) = g(x) + h(x)$, entonces $f'(x) = g'(x) + h'(x)$

① $f(x) = x^2 + 5x$

$f'(x) = 2x + 5 //$

② $f(x) = 4x^3 + x^2$

$f'(x) = 12x^2 + 2x //$

$f'(x) = 24x + 2 //$

Regla del producto

Si $f(x) = g(x) \cdot h(x)$, entonces $f'(x) = g'(x) \cdot h(x) + g(x) \cdot h'(x)$

① $f(x) = x^2 \cdot \sin(x)$

$f'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$

② $f(x) = (2x + 4) \cdot e^x$

$f'(x) = 2 \cdot e^x + (2x + 4) \cdot e^x$

$f'(x) = 2e^x + 2xe^x + e^x$

$f'(x) = 3e^x + 2xe^x //$

Fecha: 20-03-2025

Reflex 20

Temu: Puntos críticos

1) $f(x) = -x^2$

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

$f'(x) = 0$

$f''(x) = -2$

2) $-2x = 0$

$x = \frac{0}{2}$

$x = 0 //$

$y = -x^2$

$y = -(0)^2$

$y = 0 //$

C = (0, 0)

Formulas

 $f''(x) \geq 0 \rightarrow$ Punto de Inflexión \rightarrow $f''(x) > 0 \rightarrow$ Punto M^{ín} \rightarrow $f''(x) < 0 \rightarrow$ Punto M^{áx} \rightarrow

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

$f''(0) = -2 \rightarrow$ M^{áx} //

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

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

$f'(x) = 0$

$f''(x) = 12x - 8$

2) $6x^2 - 8x = 0$

$x(6x - 8) = 0$

$x = 0 //$ $6x - 8 = 0$

$x = \frac{8}{6}$

$x = \frac{4}{3} //$

$y = 2x^3 - 4x^2$

$y = 2(0)^3 - 4(0)^2$

$y = 0 //$

$y = 2\left(\frac{4}{3}\right)^3 - 4\left(\frac{4}{3}\right)^2$

$y = 2\left(\frac{64}{27}\right) - 4\left(\frac{16}{9}\right)$

$y = \frac{128}{27} - \frac{64}{9}$

$y = \frac{64}{27} //$

$P_1(0, 0)$ $P_2\left(\frac{4}{3}; -\frac{64}{27}\right)$

3) $f''(x) = 12x - 8$

$f''(0) = 12(0) - 8$

$= -8 < 0 \rightarrow$ M^{áx} // $\rightarrow P_1(0, 0)$

$f''\left(\frac{4}{3}\right) = 12\left(\frac{4}{3}\right) - 8$

$= 16 - 8$

$= 8 > 0 \rightarrow$ M^{ín} // $\rightarrow P_2\left(\frac{4}{3}; -\frac{64}{27}\right)$

3) $\frac{5}{3} - \frac{4}{7} = \left(\frac{5}{3} \cdot \frac{7}{7}\right) - \left(\frac{4}{7} \cdot \frac{3}{3}\right) = \frac{35}{21} - \frac{12}{21} = \frac{23}{21} //$

4) $\frac{4}{2} + \frac{3}{4} = \left(\frac{4}{2} \cdot \frac{4}{4}\right) + \left(\frac{3}{4} \cdot \frac{2}{2}\right) = \frac{4}{1} + \frac{6}{8} = \frac{10}{2} = \frac{5}{1} //$

5) $\frac{5}{2} - \frac{2}{3} + \frac{3}{5} = \left(\frac{5}{2} \cdot \frac{15}{15}\right) - \left(\frac{2}{3} \cdot \frac{10}{10}\right) + \left(\frac{3}{5} \cdot \frac{6}{6}\right) = \frac{75}{30} - \frac{20}{30} + \frac{18}{30} = \frac{73}{30}$

6) $\frac{20}{9} + \frac{1}{2} = \left(\frac{20}{9} \cdot \frac{2}{2}\right) + \left(\frac{1}{2} \cdot \frac{9}{9}\right) = \frac{40}{18} + \frac{9}{18} = \frac{49}{18} //$

7) $\frac{3}{7} + \frac{1}{5} - \frac{10}{3} = \left(\frac{3}{7} \cdot \frac{15}{15}\right) + \left(\frac{1}{5} \cdot \frac{24}{24}\right) - \left(\frac{10}{3} \cdot \frac{35}{35}\right) = \frac{45}{105} + \frac{24}{105} - \frac{350}{105} = \frac{69}{105} - \frac{350}{105} = \frac{-281}{105}$

Fecha: 25-03-2025

Referenz

L' Hopital

⑦ $\frac{d}{dx} \ln x \rightarrow f'(x) = \frac{1}{x}$
 $\frac{d}{dx} \ln x \rightarrow g'(x) = 1$

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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W. L. G. A. 0.617

$$x + \beta \leq 1$$

$$1.1 \times 10^{-3} \text{ mol/l}$$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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② $\lim_{x \rightarrow 0} \frac{\sin 3x}{x - \frac{2}{3} \sin 2x}$

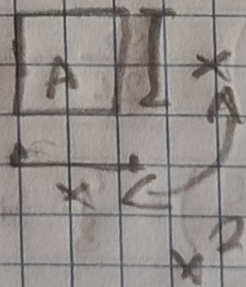
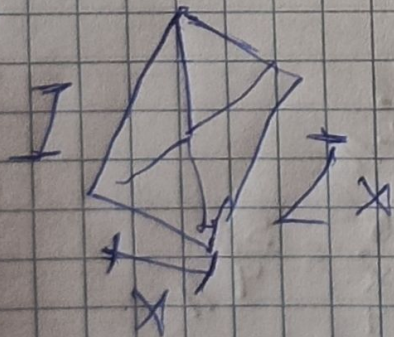
$$f(x) = \sin(3x) \quad g(x) = x - \frac{3}{2} \sin(2x)$$

$$f'(x) = 3 \cdot \cos(3x) \quad g'(x) = 1 - \frac{\pi}{2} \cdot 2 \cdot \cos(2x) \rightarrow 1 - 3 \cos(2x)$$

$$\lim_{x \rightarrow 0} \frac{3 \cos(3x)}{4 - 3 \cos(2x)}$$

$$\lim_{x \rightarrow 0} \frac{3 \cos(2x)}{1 - 3 \cos(2x)}$$

$$\lim_{x \rightarrow 0} \frac{3 \cdot x}{1 - 3 \cdot x} = \frac{3}{-2} = -\frac{3}{2} //$$



$A = 2$

$$V = 3$$

$$V = 252 \text{ m}^3 = y \cdot x \cdot x \Rightarrow V = x^2 \cdot y$$

$$f = \square = 5 \cdot x^2 - x^2$$

$$T \Delta = 2.5 \cdot 10^2$$

$$L = \sqrt{3.5 \cdot 4 \cdot \pi}$$

$$F(x) = 5x^2 + 2.5x^2 + 14xy$$

$$F(x) = 7.5x^2 + 14x \left(\frac{3528}{x^2} \right)$$

$$F(x) = 7.5x^2 + \frac{3528}{x}$$

$$F'(x) = 15x + \left(\frac{-3528}{x^2} \right)$$

$$= \frac{3528}{x^2} + 15x = 0$$

$$- \frac{3528}{x^2} = -15x$$

$$-3528 = -15x \cdot x^2$$

$$-3528 = -15x^3$$

$$x^3 = \frac{3528}{15}$$

$$x^3 = \frac{476}{5}$$

$$\sqrt[3]{x^3} = \sqrt[3]{\frac{476}{5}}$$

$$x = 6.17 //$$

$$F(x) = 7.5x^2 + \frac{3528}{x} \rightarrow F(x) = y$$

$$F(6.17) = 7.5(6.17)^2 + \frac{3528}{6.17}$$

$$F(6.17) = 285.51 + 571.79$$

$$F(6.17) = 857.3 //$$

$$y = \frac{25^2}{x^2}$$

$$y = \frac{25^2}{(6.17)^2}$$

$$y = 6.64 //$$

Auxiliar

$$b(x) = \frac{3528}{x}$$

$$b'(x) = 3528 \cdot x^{-2}$$

$$b''(x) = 3528 \cdot (-2) \cdot x^{-3}$$

$$b''(x) = -3528 \cdot x^{-3}$$

$$b'(x) = -\frac{3528}{x^2}$$