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2: Calcula mediante la formula de la derivada de una potencia:

formulas $\frac{d}{dx} x^n = nx^{n-1}$

$\frac{d}{dx} cv = c \cdot \frac{d}{dx} v$

$a^{-n} = \frac{1}{a^n}$

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

Aplicando propiedad $a^{-n} = \frac{1}{a^n}$

$f'(x) = 5$

Aplicando formulas $\frac{d}{dx} x^n$ y $\frac{d}{dx} cv$

$f'(x) = 5 \cdot \frac{d}{dx}(x^{-5}) = 5(-5x^{-5-1}) = 5(-5x^{-6})$

$f'(x) = -25x^{-6}$

Pasar a exponente positivo

$- f'(x) = -\frac{25}{x^6}$

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

Aplicando propiedad $a^{-n} = \frac{1}{a^n}$

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

Aplicando formulas $\frac{d}{dx} x^n$ y $\frac{d}{dx} cv$

$f'(x) = 5 \cdot \frac{d}{dx}(x^{-5}) + 3 \cdot \frac{d}{dx}(x^{-2}) = 5(-5x^{-6}) + 3(-2x^{-2-1})$

$f'(x) = -25x^{-6} + 3(-2x^{-3}) = -25x^{-6} - 6x^{-3}$

Pasar a exponente Positivo

$\rightarrow f'(x) = -\frac{25}{x^6} - \frac{6}{x^3}$

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

Aplicando Propiedad $\sqrt[n]{a^m} = a^{m/n}$

$f(x) = x^{1/2}$

Aplicando formula $\frac{d}{dx} x^n = nx^{n-1}$

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

Pasar a exponente Positivo $= f'(x) \frac{1}{2x^{1/2}} \rightarrow f'(x) = \frac{1}{2\sqrt{x}}$

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

Aplicando propiedades $a^{-n} = \frac{1}{a^n}$ y $\sqrt[n]{a^m} = a^{m/n}$

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

Aplicando formula $\frac{d}{dx} x^n = nx^{n-1}$

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

Convertir radical

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

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

Multiplicando

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

Aplicando formula $\frac{d}{dx} x^n = nx^{n-1}$

$f'(x) = -\frac{3}{2} x^{-3/2 - 2/2} = -\frac{3}{2} x^{-5/2}$

Convertir radical

$f'(x) = -\frac{3}{2x^{5/2}} \rightarrow f'(x) = -\frac{3}{2\sqrt{x^5}}$

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

Aplicando propiedad $\sqrt[n]{a^m} = a^{m/n}$

$f(x) = x^{2/3} + x^{1/2}$

Aplicando formula $\frac{d}{dx} x^n = nx^{n-1}$

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

Convertir radical

$f'(x) = \frac{2}{3x^{1/3}} + \frac{1}{2x^{1/2}} \rightarrow f'(x) = \frac{2}{3\sqrt[3]{x}} + \frac{1}{2\sqrt{x}}$

Escaneado con CamScanner

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

Aplicando formula $\frac{d}{dx} V^n = nV^{n-1} \frac{d}{dx} V$

$f'(x) = 4(x^2+3x-2)^{4-1} \frac{d}{dx}(x^2+3x-2)$

Derivando V

$V = x^2+3x-2 \qquad dV = 2x+3$

Sustituir

$f'(x) = 4(x^2+3x-2)^3(2x+3) \to f'(x) = 4(2x+3)(x^2+3x-2)^3$

$\to f'(x) = (8x+12)(x^2+3x-2)^3$

3: Calcula mediante la formula de la derivada de una raiz:

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

Aplicando formula $\frac{d}{dx}\sqrt{V}$

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

Derivando V

$V = x^2-2x+3 \qquad dV = 2x-2x$

Sustituir

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

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

Aplicando formula $\frac{d}{dx}\sqrt[n]{V}$

$$f'(x) = \frac{1}{4\sqrt[4]{x^5-x^3-2)^{4-1}}} \frac{d}{dx}(x^5-x^3-4)$$

Derivando V

$V = x^5-x^3-4 \qquad dV = 5x^4-3x^2$

Sustituir

$$f'(x) = \frac{1}{4\sqrt[4]{(x^5-x^3-2}}(5x^4-3x^2$$

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

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