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**PASIÓN POR EDUCAR**

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# Problemas Unidad 4

$$y = x^5 + 5x^4 - 10x^2 + 6$$

$$U^n = nU^{n-1}$$

Formula:

26-06-23.

(1)

$$y' = \frac{d(x^5)}{dx} + 5 \frac{d(x^4)}{dx} - 10 \frac{d(x^2)}{dx} + \frac{d(6)}{dx}$$

$$= 5x^4 + 20x^3 - 20x$$

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

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

(2)

$$y' = \frac{3}{2} x^{-1/2} - \frac{3}{2} x^{1/2} - \frac{2}{3} x^{-4/3}$$

$$y' = \frac{3}{2\sqrt{x}} - \frac{3\sqrt{x}}{2} - \frac{2}{3\sqrt[3]{x^4}}$$

$$y = \frac{1}{x^2} + 4x^{-1/2}$$

(3)

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

$$y' = -x^{-3} - 2x^{-3/2}$$

$$y' = -\frac{1}{x^3} - \frac{2}{\sqrt{x^3}}$$

$$y = \sqrt{2x} + 2\sqrt{x}$$

$$y = \sqrt{2} \sqrt{x} + 2\sqrt{x}$$

$$y' = \sqrt{2} \frac{d(x^{1/2})}{dx} + 2 \frac{d(x^{1/2})}{dx}$$

(4)

$$y' = \sqrt{2} x^{-1/2} + x^{-1/2}$$

$$y' = \frac{\sqrt{2}}{2\sqrt{x}} + \frac{1}{\sqrt{x}} = \frac{1}{2} \frac{\sqrt{2}}{x} + \frac{1}{\sqrt{x}}$$

26-06-23

$$F(t) = \frac{2}{\sqrt{t}} + \frac{6}{\sqrt[3]{t}}$$

$$F'(t) = 2t^{-1/2} + 6t^{-2/3}$$

$$F'(t) = 2t^{-3/2} + 6t^{-4/3}$$

$$F'(t) = \frac{2}{\sqrt{t^3}} + \frac{6}{\sqrt[3]{t^4}}$$

$$y = (1-5x)^6$$

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

$$y' = -30(1-5x)^5$$

~~$$y = (3+4x-x^2)^{1/2}$$~~

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

$$y' = \frac{1}{2}(3+4x-x^2)^{-1/2} \cdot (4-2x)$$

$$y' = \frac{4-2x}{2\sqrt{3+4x-x^2}}$$

$$F(x) = (3x-x^3+1)^4$$

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

$$F'(x) = 4(3x-x^3+1)^3 \cdot (3-3x^2)$$

$$F'(x) = (12-12x^2)(3x-x^3+1)^3$$

28-06-23

①  $y = \cos x$

$\cos y = -\operatorname{sen} \frac{dy}{dx}$

$y' = -\operatorname{sen} x$

②  ~~$y = x^2 \operatorname{sen} x^2$~~  (1)

$y = \cos x^2$

$y' = \operatorname{sen} x^2 \cdot d(x^2)$

$u dv + v du$

$y' = -2x \operatorname{sen} x^2$

③  ~~$y = x^2 \operatorname{sen} x^2$~~

$y = x^2 \cdot \operatorname{sen} x^2$

$u = x^2 \quad v = \operatorname{sen} x^2$

$dy = 2x^3 \cos x^2 + 2x \operatorname{sen} x^2$

③  $y = \frac{\cos x}{x^2}$

$v = \cos x \quad u = x^2$

$dv = -\operatorname{sen} x \quad du = 2x$

$\frac{-x^2 \operatorname{sen} x - 2x \cos x}{x^4} = \frac{x(\operatorname{sen} x - 2 \cos x)}{x^4}$

$y' = \frac{-x \operatorname{sen} x - 2 \cos x}{x^3}$

④  $y = \cos x \cdot \operatorname{sen} x$

$v = \cos x$

$u = \operatorname{sen} x$

$u dv + v du$

$dv = -\operatorname{sen} x$

$du = \cos x$

$y' = \cos^2 x - \operatorname{sen}^2 x$