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Grado: 4

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PROBLEMA 10

OPINAD IV

26-06/26

$$\textcircled{1} y = x^5 + 5x^4 - 10x^3 + 6$$

$$y' = \frac{d}{dx} (x^5) + 5 \frac{d}{dx} (x^4) - 10 \frac{d}{dx} (x^3) + \frac{d}{dx} (6)$$

$$y' = 5x^4 + 20x^3 - 30x^2$$

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

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

$$y' = \frac{3}{2} x^{-1/2} - \frac{9}{2} x^{1/2} - \frac{2}{3} x^{-3/2}$$

$$y' = \frac{3}{2\sqrt{x}} - \frac{9}{2}\sqrt{x} - \frac{2}{3\sqrt{x^3}}$$

$$\textcircled{3} y = \frac{1}{2x^2} + \frac{4}{\sqrt{x}} = \frac{1}{2}x^{-2} + 4x^{-1/2}$$

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

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

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

$$\textcircled{4} y = \sqrt{2x} + 2\sqrt{x}$$

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

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

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

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

$$\textcircled{5} F(t) = \frac{2}{\sqrt{t}} + \frac{6}{\sqrt[3]{t}}$$

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

$$F'(e) = 2e^{-3/2} + 6e^{-4/3}$$

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

$$\textcircled{6} y = (1 - 5x)^5$$

$$y' = 5(1 - 5x)^4 \cdot \frac{d}{dx}(1 - 5x)$$

$$y' = -30(1 - 5x)^4$$

$$\textcircled{7} f(x) = (3x - x^3 + 1)^4$$

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

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

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

$$\textcircled{8} y = (3 + 4x - x^2)^{1/2}$$

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

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

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