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Nombre del tema: Problemario

Parcial: 4rta Unidad

Nombre de la Materia: Calculo

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Nombre de la Licenciatura: Técnico en enfermería

Semestre: 4rto Semestre

Lugar y Fecha de elaboración

① $y = 2x^3 - 6x^2 - 7 + 11$

$y' = 6x^2 - 2x - 11 =$

② $y = \frac{11}{4}x^3 + \frac{7}{8}x^2$

$y' = \frac{33}{4}x^2 + \frac{14}{3}x$

③ $y = 11 - 2x^2 - 6x^3$

$y' = -x^2 - 18x^2$

④ $y = \frac{x}{x^2 - 8x}$ $\to$ $\frac{U}{V} = \frac{Vdu - Udv}{V^2}$

$u = x$ $\qquad v = x^2 - 8x$

$du = 1$ $\qquad dv = 2x - 8$ $\qquad y' = \frac{(x^2 - 8x)(1) - (x)(2x - 8)}{(x^2 - 8x)^2}$

$v^2 = (x^2 - 8x)^2$

$\qquad\qquad\qquad\qquad y' = \frac{x^2 - 8x - 2x^2 + 8x}{(x^2 - 8x)^2} = \frac{-x^2}{(x^2 - 8x)^2}$

⑤ $y = \dfrac{5}{3x-4}$

$u=5 \qquad v=3x-4 \qquad\qquad y' = \dfrac{(3x-4)(0) - 5(3)}{(3x-4)^2}$

$du=0 \qquad dv=30$

④ $y = (3x+2)(2x+1)$

$u = 3x+2 \qquad v = 2x-1$

$du \qquad\qquad dv = 2$

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

$y' = 3(2x-1) 2 (3x+2)$

$\dfrac{(2x-1)2 \cdot (x-3)}{(2x+4)}$

$(2x-1)^2$

$= \dfrac{6x-3 \cdot 6x-4}{(2x-1)^2}$

$= \dfrac{-7}{(2x+1)^2}$

② $y = \dfrac{(3x^2+1)}{2x}$

$u = (3x^2+1) \qquad v = 2x \qquad\qquad y' = \dfrac{(2x)(6x) - (3x^2+1)(2)}{(2x)^2}$

$du = 6x \qquad dv = 2 \qquad y' = \dfrac{2^2 \cdot 6x^2 + 2 - 6x^2 - 2}{4x^2} = \dfrac{6x^2-2}{4x^2}$

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

(8) $y = \dfrac{5}{(4+x^2)}$

$u = 5 \qquad v = (4+x^2) \qquad v' = (5)(2x) \div (4+x^2)$

$du = 0 \qquad dv = 2x$

$$\dfrac{}{(4+x^2)^2}$$

$$y' = \dfrac{10x + (4+x^2)}{(4+x^2)^2}$$

$$\boxed{y' = \dfrac{-x^2 + 10x - 4}{(4+x^2)^2}}$$

(9) $y = (1+2x)^2$

$x = 1+2x$

$n = 2$

$n+1 = 1 \qquad\qquad y' = 2(1+2x)^2 \cdot (2)$

$dx = 2 \qquad\qquad\qquad y' = 4(1+2x)^2$

(10) $y = \dfrac{3}{5}x^2 - \dfrac{3}{4}x + \dfrac{1}{8}$

$\dfrac{3}{5}\dfrac{d}{dx}(x^2) - \dfrac{3}{4}\dfrac{d}{dx}(x) + \dfrac{1}{dx}\left(\dfrac{1}{8}\right)^0$

$$\dfrac{3}{5}\dfrac{2}{1} + -\dfrac{3}{4}(1)$$

$$\dfrac{6}{5}x - \dfrac{3}{4} =$$

(11) $y = \dfrac{2x^3}{Tanx^2}$

$u = 2x^3 \qquad v = Tanx^2 \qquad\qquad v^2 = (Tanx^2)^2$

$du = 9x \qquad dv = 2x\sec^2 x^2$

$y' = \dfrac{9x\,Tanx^2 - 4x^3 \sec^2 x^2}{(Tanx^2)^2}$

$$\boxed{y' = \dfrac{9x(Tanx^2 - x^2\sec^2 x^2)}{(Tanx^2)^2}}$$

(12) $y = 3x^2 \cos 3x^2$

$u = 3x^2 \qquad v = \cos 3x^2$

$du = 6x \qquad dv = -6x \sin 3x^2$

$y' = 3x^2 (-6x \sin 3x^2) + 6x (\cos 3x^2)$

$y' = \boxed{-18x^3 \sin 3x^2 + 6x \cos 3x^2}$

(13) $y = \sin x^2 \cdot \cos x^2$

$u = \sin x^2 \qquad v = \cos x^2$

$du = -2x \cos x^2 \qquad dv = -2x \sin x^2$

$y' = (\sin x^2)(-2x \sin x^2) + (\cos x^2)(2x \cos x^2)$

$y' = (\sin x^2)(-2x+1) + (\cos x^2)(2x+1)$

(14) $y = \cot 3x^3$

$y' = -\csc^2 3x^3 \cdot \frac{d}{dx}(3x^3)$

$y' = 9x^3 \csc^2 3x^3$

(15) $y = \sqrt{4^3 \cos x^2} = \sqrt{2x^3} \cdot \sqrt{\cos x^2}$

$u = \sqrt{2x^3} \qquad v = \sqrt{\cos x^2}$

$u = \sqrt{2x^3}^{1/2} \qquad v = (\cos x)^{\frac{1}{2}}$

$u = 2x^{3/2} \qquad dv = \frac{1}{2}(\cos x)$

$3\sqrt{x^3}\sqrt{\cos x^2} \qquad dv = 3x^{1/2} \qquad 2x \sin x^2$

$y = \frac{\sqrt{2x^3} \cdot x \sin x^2}{3 \sqrt{\cos x^2}} \qquad du = 3\sqrt{x^3} \qquad dv = x \sin x^2$

$v = \cos x^2$

(16) $y = \sqrt{2x^3 \sec 2x}$

$x = \sqrt{\sec 2x}$

$u = (\sec 2x)^{\frac{1}{2}}$

$dx = \frac{1}{2} (\sec 2x)^{-\frac{1}{2}} \cdot 2 \sec 2x \cdot \tan 2x$

$du = \dfrac{\sec 2x \cdot \tan 2x}{\sqrt{\sec 2x}}$

$y' = 3\sqrt{x \sec 2x \tan 2x} \div \sqrt{\sec 2x} + 3\sqrt{x \sec 2x}$

(17) $y = 2x^3 \cdot \sqrt{5x^3}$

$u = 2x^3 \qquad v = \sqrt{5x^3}$

$du = 6x^2 \qquad dv = 13x^2 \qquad 15x$

$\qquad\qquad 2(5x^3)^{\frac{1}{2}} \qquad \sqrt{5x}$

$y' = 2x^3 \left(\dfrac{15x^2}{2\sqrt{5x}}\right) + 6x^2 \left(\sqrt{5x^3}\right)$

$y' = \dfrac{30x^3}{\sqrt{5x^2}} + 6x^2 \sqrt{5x^3}$

$y' = \dfrac{15x^3}{\sqrt{5x^2}} + 6x^2 \sqrt{5x^3}$

(18) $y = 4 \sec 2x^4$

$y' = 4 \sec 2x^4 \tan 2x^4 \qquad \frac{d}{dx}(2x^4)$

$y' = 4(8x^3) \sec 2x^4 \cdot \tan 2x^4$

$y' = 32x^3 \sec 2x^4 \tan 2x^4$