



Mi Universidad

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Nombre del tema: Problemario

Parcial: IV Unidad

Nombre de la Materia: Calculo

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Nombre de la Licenciatura: Enfermería

Semestre: 4 Semestre

Problemcario

$$1 = y = 2x^3 - 6x^2 - 7x + 11$$

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

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

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

$$3 = y = 11 - 2x^2 - 6x^3$$

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

$$4 = y = \frac{x}{x^2 - 8x}$$

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

$$du = 1 \quad dv = 2x - 8$$

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

$$v dv = u dv$$

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

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

$$5 = y = \frac{5}{3x - 4}$$

$$u = 5 \quad v = 3x - 4$$

$$du = 0 \quad dv = 3$$

$$y' = \frac{(3x - 4)(0) - 5(3)}{(3x - 4)^2}$$

$$6 = y = (3x + 2)(2x - 1)$$

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

$$du = 3 \quad dv = 2$$

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

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

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

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

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

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

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

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

7. $y = \frac{(3x^2 + 1)}{2x}$

$u = (3x^2 + 1)$ $v = 2x$
 $du = 6x$ $dv = 2$

$$y' = \frac{(2x)(6x) - (3x^2 + 1)(2)}{(2x)^2}$$

$$y' = \frac{2^2 - 6x^2 + 2}{4x^2} = \frac{6x^2 - 2}{4x^2}$$

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

8. $y = (1 + 2x)^2$

$v = 1 + 2x$
 $n = 2$
 $n - 1 = 1$
 $dv = 2$

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

$$y' = 4(1 + 2x)$$

10. $y = \frac{3}{5}x^2 - \frac{3}{4}x + \frac{1}{8}$

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

$$\frac{3}{5} \cdot 2x - \frac{3}{4} \cdot (1)$$

$$\frac{6}{5}x - \frac{3}{4}$$

11. $y = \frac{2x^2}{\tan x^2}$

$u = 2x^2$ $v = \tan x^2$
 $du = 4x$ $dv = 2x \sec^2 x^2$
 $v^2 = (\tan x^2)^2$

$$y' = \frac{4x \tan x^2 - 4x^3 \sec^2 x^2}{(\tan x^2)^2}$$

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

12: $y = 3x^2 \cos 3x^2$
 $u = 3x^2$ $v = \cos 3x^2$ $y' = 3x^2 (-6x \sin 3x^2) + 6x (\cos 3x^2)$
 $du = 6x$ $dv = -6x \sin 3x^2$ $y' = 18x^3 \sin 3x^2 + 6x \cos 3x^2$

13: $y = \sin x^2 \cdot \cos x^2$
 $u = \sin x^2$ $v = \cos x^2$
 $du = 2x \cos x^2$ $dv = -2x \sin x^2$
 $y' = (\sin x^2) (-2x \sin x^2) + (\cos x^2) (2x \cos x^2)$
 $y' = (\sin x^2) (-2x + 1) + (\cos x^2) (2x + 1)$

14: $y = \cot 3x^3$
 $y' = \csc^2 3x^3 \frac{d}{dx} (3x^3)$
 $y' = 9x^2 \csc^2 3x^3$

15: $y = \sqrt{2x^3} \cos x^2 = \sqrt{2x^3} \sqrt{\cos x^2}$
 $u = \sqrt{2x^3}$ $v = \sqrt{\cos x^2}$
 $u = \sqrt{2x^3}^{1/2}$ $v = (\cos x^2)^{1/2}$
 $u = 2x^{3/2}$ $du = \frac{1}{2} (\cos x)$
 $3 \sqrt{x} \sqrt{\cos x^2}$ $dv = 3x^{1/2} 2x \sin x^2$ $dv = 3\sqrt{x} \quad dv = x \sin x^2$
 $y' = \sqrt{2x^3} x \sin x^2$ $y = \cos x^2$
 $y' = 3\sqrt{\cos x^2}$

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

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

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

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

$$du = \sec 2x \cdot \tan 2x$$

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

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

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

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

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

$$du = 6x^2 \quad dv = \frac{13x^2}{2(5x^5)^{1/2}} = \frac{15x}{2\sqrt{5x}}$$

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

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

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

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

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

19 = $y = (\cos 2x^3)^3$
 $u = \cos 2x^3$
 $n = 3$
 $n-1 = 2$
 $du = -6x^2 \operatorname{sen} 2x^3$
 $y' = 3 (\cos 2x^3)^2 \cdot (-6x^2 \operatorname{sen} 2x^3)$
 $y' = -18x^2 (\cos 2x^3)^2 \operatorname{sen} 2x^3$

20 = $y = \left(\frac{1}{\operatorname{sen} x^2}\right)^2$ $y = (\operatorname{sen} x^2)^{-2}$
 $n = -2$
 $n-1 = -3$
 $u = \operatorname{sen} x^2$
 $y' = -2 (2x \cos) x^2$
 $y' = -2 (2x \cos x^2) (\operatorname{sen} x^2)^3$
 $y' = 4x \cos x^2 (\operatorname{sen} x^2)^3$