$$\frac{VdU - UdV}{V^2}$$

$$y = \frac{10x^2}{5x+2}$$

$U \quad V$

$U = 10x^2 \qquad V = 5x+2$

$Ud = 20x \qquad Vd = 5x+2$

$$5x+2(20x) - 10x(5x+2)$$

$$100x^2 + 40x - 50x^2 - 20x^2$$

$$y = \frac{1}{4x^2+3x}$$

$U \quad V$

$U = 1 \qquad V = 4x^2+3x$

$dU = 0 \qquad dV = 8x+3$

$$4x^2+3x(0) - 1(8x+3)$$

$$0 - 8x + 3$$

$$-8x-3$$

20

$$y = \frac{1}{(\sin x^2)^2}$$

$y = (\sin x^2)^{-2}$

$n = -2$

$n - 1 = -3$

$v = \sin x^2$

$dv = 2x \cos x^2$

$y' = -2(\sin x^2)^{-3} \cdot (2x \cos x^2)$

14.- $\cot(3x^3) = \csc^2 u \cdot \frac{du}{dx}$

$-\csc^2 3x^3 \ (9x^2)$

$-9x^2 \csc^2 3x^3$

15.- $\sqrt{2x^3 \cos x^2}$ $\quad nu^{n-1} \frac{du}{dx}$ $\quad 2x^3 \cdot \cos x^2$

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

$\frac{1}{2} \cdot (2x^3 \cos x^2)^{-1/2} \cdot (\quad)$ $\quad du = 6x^2 \quad dv = -2x \operatorname{sen} x^2$

$\rightarrow -4x^4 \operatorname{sen} x^2 + 6x^2 \cos x^2$

$y' = \frac{-4x^4 \operatorname{sen} x^2 + 6x^2 \cos x^2}{2\sqrt{2x^3 \cos x^2}}$

$y' = \frac{-4x^4 \operatorname{sen} x^2 + 6x^2 \cos x^2}{\sqrt{2x^3 \cos x^2}}$

Scanned with CamScanner

18.- $\frac{d}{dx}\left[\sec 2x^4\right] = \sec u \cdot \tan u \frac{du}{dx}$ $\quad du = 8x^3$

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

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

$(32x^3 \sec 2x^4)(\tan 2x^4)$

19.- $(\cos 2x^3)^3$

Gdera

16.- $\sqrt{2x^3 \sec 2x}$ $\quad u' = nu^{n-1} \cdot \frac{du}{dx}$

$y' = (2x^3 \sec x^2)^{1/2}$

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

u	v
$2x^3$	$\sec x^2$

$(2x^3)(2x \sec x^2 \tan x^2) +$

$+ (6x^2)(\sec x^2)$

$6x^2 \sec x^2$

$y' = \left[\frac{1}{2}(2x^3 \sec x^2)^{-1/2}\right] \cdot \left[4x^4 \sec x^2 \tan x^2 + 6x^2 \sec x^2\right]$

$y' = \frac{4x^4 \sec x^2 \tan x^2 + 6x^2 \sec x^2}{2\sqrt{2x^3 \sec x^2}}$

17.- $(2x^3)(\sqrt{5x^3})$ $\quad u \cdot v = du \cdot v + dv \cdot u$

$u = 2x^3$

$du = 6x^2$

$y' = 6x^2 \cdot (5x^3)^{1/2} + (15x^2)^{1/2} \cdot 2x^3$

$v = (5x^3)^{1/2}$

$dv = (15x^2)^{1/2}$

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

$u^n = nu^{n-1} \frac{du}{dx}$

19: $y = (\cos 2x^3)^3$

$u = \cos 2x^3$

$du = -\operatorname{sen} 2x^3 \cdot (6x^2)$

$du = -6x^2 \operatorname{sen} 2x^3$

$y = 3(\cos 2x^3)^2 \cdot (-6x^2 \operatorname{sen} 2x^3)$

$y = -18x^2 \operatorname{sen} 2x^3 \cdot (\cos 2x^3)^2$

11 $y = \frac{2x^2}{\tan x^2}$ (u / v)

$\frac{u}{v} = \frac{v\,du - u\,dv}{v^2}$

$u = 2x^2 \quad du = 4x$

$v = \tan x^2 \quad dv = 2\sec^2 x^2$

$\frac{\tan x^2 \cdot 4x - 4x^2 \sec^2 x^2}{(\tan x^2)^2}$

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

11.- $\frac{2x^2}{\tan x^2}$ $\quad u = 2x^2 \quad v = \tan x^2$

$du = 4x \quad dv = 2x \sec^2 x^2$

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

12.- $3x^2 \cos 3x^2$ $\quad u \quad v$

$$u \cdot v = \frac{du \cdot v - dv \cdot u}{v^2}$$

$u = 3x^2 \quad du = 6x$

$v = \cos 3x^2 \quad dv = -\sin 6x$

$$y' = \frac{6x \cdot \cos 3x^2 - -\sin 6x \cdot 3x^2}{(\cos 3x^2)^2}$$

13.- $\sin x^2 \cos x^2$ $\quad u \cdot v = \frac{du \cdot v + dv \cdot u}{v^2}$

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

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

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

18.- $y = \sec 2x^4 = \sec v \cdot \tan v \frac{dv}{dx}$ $\quad dv = 8x^3$

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

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

$(32x^3 \sec 2x^4)(\tan 2x^4)$

19.- $(\cos 2x^3)^3 \quad v^n = nv^{n-1} \frac{dv}{dx}$

$v = \cos 2x^3$

$dv = -\operatorname{sen} 2x^3 \cdot (6x^2) \quad n-1 = 2$

$dv = -6x^2 \operatorname{sen} 2x^3 \quad n = 3$

$y = v^n$

$y' = 3(\cos 2x^3)^2 \cdot (-6x^2 \operatorname{sen} 2x^3)$

$y' = -18x^2 \operatorname{sen} 2x^3 \cdot (\cos 2x^3)^2$

20.- $y = \frac{1}{(\operatorname{sen} x^2)^2} \quad v^n = nv^{n-1} \frac{dv}{dx} \quad y = (\operatorname{sen} x^2)^{-2}$

$n = -2 \quad n-1 = -3$

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

$y' = -2(\operatorname{sen} x^2)^{-3} \cdot (2x \cos x^2)$

$y' = (\operatorname{sen} x^2)^{-3} \cdot (-4x \cos x^2)$

$y' = \frac{-4x \cos x^2}{(\operatorname{sen} x^2)^3}$