26-6-2024

$$\int v^n = \frac{v^{n+1}}{n+1} + C \qquad \int dx = x + C$$

UDS

PROBLEMARIO

$$\int \tan v \, dv = -\ln|\cos v| + C \qquad \int \frac{dv}{v} = \ln v + C$$

Calculo Marely Concepcion Jimenez Gordillo

Plataforma

Cálculo

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

$6x^2 - 12x - 7$

2. $Y = 11/4\,x^3 + 7/3\,x^2$

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

3. $Y = 11 - 2x^2 - 6x^3$

$-x^2 - 18x^2$

4. $Y = X/(x^2 - 8x)$ $\qquad \frac{V\,dU - U\,dV}{V^2}$

$V = x \qquad U = x^2 - 8x$

$dV = 1 \qquad dU = 2x - 8$

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

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

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

5 $Y = 5/(3x-4)$

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

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

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

$$y' = \frac{-15}{(3x-4)^2}$$

6- $Y = (3x+2)/(2x-1)$

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

$du = 3x-1$ $\quad dv = 2$

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

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

$$= \frac{6x-3-6x-4}{(2x-1)^2} = \frac{-7}{(2x-1)^2}$$

7- $V = (3x^2+1)/(2x)$

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

$$= \frac{12x^2 - 6x^2 + 2}{4x^2} = \frac{6x^2+2}{4x^2}$$

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

8. $Y = 5/(4+x^2)$

$u = 5$ $\quad v = 4+x^2$ $\quad y' = (5)(2x) + (4+x^2)$

$du = 0$ $\quad dv = 2x$

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

9. $Y = (1+2x)^2$

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

$n = 2$ $\quad y' = 4(1+2x)^2$

$n-1 = 1$

$du = 2$

10. $Y = 3/5\,x^2 - 3/4\,x + 1/8$

$$\frac{3}{5}\frac{d}{dx}(x^2) - \frac{3}{4}\frac{d}{dx}(x) + \frac{d}{dx}(1/8)$$

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

$$\left(\frac{6}{5}x - \frac{3}{4}\right)$$

11. $2x^2/\tan x^2$ $\quad u = 2x^2$ $\quad v = \tan x^2$

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

$v^2 = (\tan x^2)^2$

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

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

12- $3x^2 \cos 3x^2$

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

$du = 6x \qquad dv = -6x \operatorname{SEN} 3x^2$

13- $\operatorname{SEN} x^2 \cos x^2$

$u = \operatorname{SEN} x^2 \qquad v = \cos x^2$

$du = 2x \cos x^2 \qquad dv = 2x \operatorname{SEN}^2$

$y' = (\operatorname{SEN} x^2)(-2x \operatorname{SEN} x^2) + (\cos x^2)(2x \cos x^2)$

$y' = (\operatorname{SEN}^2)(-2x+1) + \cos x^2 (2x+1)$

14- $\operatorname{COT} 3x^3$

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

$y' = 9x^2 \operatorname{CSC}^2 3x^3$

15- $\sqrt{2x^3 \cos x^2} = \frac{u}{\sqrt{2x^3}} \cdot \frac{v}{\sqrt{\cos x^2}}$

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

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

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

$du = 3x^{1/2} \qquad dv = \frac{x \operatorname{SEN} x^2}{\sqrt{\cos x^2}}$

$du = 3\sqrt{x}$

$y' = \sqrt{2x^3} \cdot \frac{x \operatorname{SEN} x^2}{\sqrt{\cos x^2}} + 3\sqrt{x}\sqrt{\cos x^2}$

$y' = \sqrt{2x^3} \cdot \frac{x \operatorname{SEN} x^2}{\sqrt{\cos x^2}} + 3\sqrt{x}\cos x^2$

16. $\sqrt{2x^3 \sec 2x}$

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

$V = (\sec 2x)^{1/2}$

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

$dv = \frac{\sec 2x \cdot \tan 2x}{\sqrt{\sec 2x}}$

$V = \sqrt{2x}$

$dv = 3\sqrt{x}$

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

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

17. $2x^3\sqrt{5x^3}$

$U = 2x^3$

$dU = 6x^2$

$V = \sqrt{5x^3}$

$dv = \frac{15x^2}{2(5x^3)^{1/2}} = \frac{15x^2}{2\sqrt{5x^3}}$

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

18. $4 \sec 2x^4$

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

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

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

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

$V = \cos 2x^3$

$n = 3$

$n - 1 = 2$

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

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

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

20- $1/(\operatorname{sen} x^2)^2$ $\quad u^n = n u^{n-1} \cdot \frac{du}{dx}$

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

$n = -2$

$n - 1 = -3$

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

$du = 2x \cos x^2$

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

$= -2 (2x \cos x^2)$

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

$= -4x \cos x^2$

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