Derivada - Cociente

Solución

$$\frac{d}{dx}\left(\frac{4}{\sqrt{\operatorname{sen}(5x)}}\right)$$

Bit Planet

Forma ①

$* D\left(\frac{u}{v}\right) = \frac{Du\,v - u\,Dv}{v^2}$

$* \sqrt{\operatorname{sen}(5x)} = (\operatorname{sen}(5x))^{\frac{1}{2}}$

$* \frac{4}{(\operatorname{sen}(5x))^{\frac{1}{2}}} = 4(\operatorname{sen}(5x))^{-\frac{1}{2}}$

$* \frac{d}{dx}x^n = n\,x^{n-1}$

$* \frac{d}{dx}\operatorname{sen}(x) = \cos(x)$

Forma ②

$$\frac{d}{dx}\,4(\operatorname{sen}(5x))^{-\frac{1}{2}}$$

$$= 4\left(-\tfrac{1}{2}\right)(\operatorname{sen}(5x))^{-\frac{1}{2}-\frac{2}{2}}$$

$$= \underline{4\left(-\tfrac{1}{2}\right)(\operatorname{sen}(5x))^{-\frac{3}{2}}}$$

$$= -2(\operatorname{sen}(5x))^{-\frac{3}{2}}$$

Regla de la cadena

$$D(\operatorname{sen}(5x)) = \cos(5x)$$

$$D(\operatorname{sen}(5x)) = \cos(5x)\,5 = \underline{5\cos(5x)}$$

$$\frac{d}{dx}\left(\frac{4}{\sqrt{\operatorname{sen}5x}}\right) = -2(\operatorname{sen}(5x))^{-\frac{3}{2}}\,5\cos(5x)$$

$$= \underline{\frac{-10\cos(5x)}{(\operatorname{sen}(5x))^{\frac{3}{2}}}} = \underline{\frac{-10\cos(5x)}{\sqrt{(\operatorname{sen}(5x))^3}}}$$