EQUIPO 1

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FUNCIONES TRIGONOMETRICAS DIRECTAS

1. $f(x)= \text{sen } x + \cos 4x$
$f^1= Dx \text{ se } x + Dx \cos 4x$
$f^1=(\cos x\ Dx) + (-\text{sen}x\ Dx4x)$
$f^1= \cos x\ (1) + (-\text{sen}x\ (4x))$
$f^1= \cos x -4\text{sen}x$

2. $g(x)= 2\tan 5x – 3 \sec 6x$
$g^1=2(Dx \tan 5x) – 3 (Dx \sec Dx)$
$g^1= 2 (\sec^2 5xDx5x) – 3 (\sec 6x\tan 6xDx6x)$
$g^1=2 (\sec^2 5x5x) – 3 (6\sec 6x\tan 6x)$
$g^1=10\sec^2 5x – 18\sec 6x \tan 6x$

3. $h (x) = \cot 2x + 7 \csc 3x^2$

$h^l = Dx \cot 2x + 7 (Dx \csc 3x^2)$

$h^l = - \csc^2 2x\ Dx\ 2x + 7 (- \csc 3x^2 \cot 3x^2\ Dx\ 3x^2)$

$h^l -2 \csc^2 2x + 7 (-\csc 3x \cot 3x^2 (6))$

$h^l -2 \csc^2 2x – 42x \csc 3x \cot 3x^2$

4. $i\ (x) = 4\ sen^2\ 5x - 5\ cot\ 2x^3$

$i^{l} = 4\ Dx\ (sen\ 5x)^2 – 5\ Dx\ cot\ 2x^3$

$i^{l} = 4\ Dx\ (sen\ 5x)^2\ Dx\ sen\ 5x – (\ 5\ (\ - csc^2\ 2x^3\ )\ )$

$i^{l} = 2\ sen5x\ (\ cossx\ (5)\ ) – 5\ (\ -6x^2\ csc^2\ 2x^3)$

$i^{l} = 4\ (2\ sen5x)\ 5\ cossx + 30x^2\ csc^2\ 2x^3$

$i^{l} = 40\ sen\ 5x\ cos5x + 30x^2\ csc^2\ 2x^3$

5. $J(x)= cos^2 3xsec^2 4x$

$J(x)= cos^2 3x\ Dx\ (sec4x)^2 + sec^2 4x\ Dx\ (cos3x)^2$

$J(x)=[cos^2 3x\ Dx\ (sec4x)^2\ Dx\ sec4x] + [sec^2 4x\ Dx\ (cos3x)^2\ Dx\ (cos3x)]$

$J(x)=[cos^2 3x\ 2sec4x\ sec4xtan4x\ (4)] + [sec^2 4x-2cos3x-sen3x(3)]$

$J(x)= cos^2\ 3x\ (8sec4x\ sec4xtan4x) = sec\ 4x-6cos3xsen3x$

$J(x)= 8cos^2\ 3xsec^2\ 4xtan4x-6sec^2\ 4xcos3xsen3x$

6. $K(x)= (tan4x)\ (3x-5)$

$K(x)=tan4x\ (3x-5)\ (sec^2 4x + (4x)$

$K(x)tan4x\ (6x) + (3x-5)\ (sec^2 4x\ (4))$

$K(x)= 6tan4x = 4(3x-5)\ sec^2 4x$

$K= 6xtan4x +3\ x^2-5\ (4sec^2 4x)$

7. $I(x)= \sqrt{} sen^3(2x)$

$(sen2x)^{1/2}$

$=3/2sen(2x)^{1/2}\ \ (Dx\ sen2x)$

$L = 3 \sqrt{sen2x} \cos 2x$

8. tan(x)cos(2x)/3x+6

$Dx \tan(x)\cos(2x) \circ (3x+6) – \tan(x) \cos(2x) \circ Dx (3x+6)/(3x+6)^2$

$Dx (\tan(x)) \circ \cos (2x) + \tan(x) \circ Dx (\cos(2x)) (3x+6) – (3 \circ Dx (x) + Dx (6)) \tan(x) \cos (2x)/(3x+6)^2$

$(3x+6) (\sec^2(x) \cos(2x) + (-\sin(2x)) \circ Dx (2x) \circ \tan (x)) – (3 \circ 1 + 0) \tan (x) \cos (2x)/(3x + 6)^2$

$= (3x+6) (\sec^2(x)\cos(2x)-2\circ Dx(x)\circ\tan(x)\sin(2x))-3\tan(x)\cos(2x)/(3x+6)^2$

$= (3x+6)(\sec^2(x)\cos(2x)-2\tan(x)\sin(2x))-3\tan(x)\cos(2x)/(3x+6)^2$

$= (2x+4)\tan(x)\sin(2x)+(\tan(x)(-x-2)\sec^2(x))\cos(2x)/3(x+2)^2$

9. F(x)= (sen 2x)(cos 3x)(tan 4x)

Dx (sen 2x)(cos 3x)= sen 2x DX cos 3x + cos 3x Dx sen 2x
= sen 2x sen 3x (3) + cos 3x (cos 2x (2))
3 sen 3x sen 2x + 2 cos 3x cos 2x
F(x)= (sen 2x cos 3x Dx tan 4x) + tan 4 (sen 2x cos 3x)
= sen 2x cos 3x $\sec^1 4$ (4) + tan 4 (-3sen 3x sen 2x) + tan 4x (2 cos 3x cos 2x)
F^1= 4sen 2x cos 3x $\sec^2 4x$

10. F(x) = sen (tan2x)

F^1= Cos tan 2x Dx tan 2x

F^1= Cos (tan) 2 $\sec^2 2x$

FUNCIONES TRIGONOMETRICAS INVERSAS

1. f(x) = arc sen (2x+1)

$f^1= f^1= \frac{1x}{\sqrt{1-(2x+1)^2}}$ Dx 2x+1

$f^1= \frac{2}{\sqrt{1-(4x^2+4x+1)}}$

$f^1= \frac{2}{\sqrt{-4x^2-4x}}$

2. f(x) = arc cos ($2x^2$-3)

f(x)= arc cos ($2x^2$-3)
$f^1= \frac{1}{\sqrt{1-(2x^2-3)}}$ Dx= $2x^2$-3

$f^1= \frac{4x}{\sqrt{1-(4x^4-12x^2+9)}}$

$f^1= \frac{4x}{\sqrt{1-(4x^4-12x^2-8)}}$

3. f(x) =arc tan ($x+3x^2$)

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

$=\frac{1+6x}{1+x^2+6x^3+9x^4}$

4. f(x) = arc sec (3 – x)

$= \dfrac{1}{3-x\sqrt{(3-y)^2-1}}$ Dx 3 – x = $\dfrac{-1}{3-y\sqrt{9-6x+y-1}}$

$= \dfrac{1}{3-x\sqrt{x^2-6x+8}}$

5.- f(x)= $\dfrac{\text{senx}}{\text{arc cos}x^3}$

$$f(x)= \frac{(\text{arc cos}x^3)(\cos x)-(\text{senx})\left(\frac{-3x^2}{\sqrt{1-(x^3)^2}}\right)}{(\text{arc cos}x^3)^2}$$

u= senx

du=cosx

$$f(x)= \frac{\cos x(\text{arc cos}x^3) + \left(\frac{-3x^2}{\sqrt{1-(x^3)^2}}\right)\text{senx}}{(\text{arc cos}x^3)^2}$$

v=arc $\cos x^3$

dv= $\dfrac{-3x^2}{\sqrt{1}-(x^3)2}$

FUNCIONES EXPONENCIALES

1. F(x)= $2^{(x-1)}$

F^1= $2^{(x-1)}$ in 2 (1)

F^1= $2^{(x-1)}$ in 2

2. f(x) = $4^{(x2+x)}$

f(x)= 4 (x^2+x)

$f^1 = 4^{x2+x} \ln 4 \, (Dx \, x^2+x)$
$f^1 = 4^{x2+x} \ln 4 \, (2x+1)$
f1= (2x+1) $4^{(x2+x)}$ in 4

3. f(x) = $8^{(3\text{-}2x2)}$

f1= $8^{(3\text{-}2x2)}$ in 8 (-4x)
f1= (-4x) $8^{(3\text{-}2x2)}$ in 8

4. 4. f (x) = $3^{(x^3 + x^2)}$

$f^l = 3^{x2 + x2} \ln 3 \, (Dx \, x^3 + x^2)$
$f^l = 3^{x3 + x2} \ln 3 \, (3x^2 + 2x)$
$f^l = (3x^2 + 2x) \, 3^{3 + x2} \ln 3$

5. F(x)= $e^{\text{sen } x}$

F1=1 cos x ($e^{\text{sen } x}$)

6. f(x)= $^{\text{cosx2}}$

f(x)= (2x)-senx^2 $^{\text{cosx2}}$

7. f(x)= tan($2^{4x\text{-}1}$)+In(cot e^{5x+6})

f^1 = Dx(tan$2^{4x\text{-}1}$) + Dx (In cot e^{5x+6})
f^1 = sec$^2 2^{4x\text{-}1}$ (Dx $2^{4x\text{-}1}$) + Dx cot e^{5x+6}/cot e^{5x+6}
f^1 = sec$^2 2^{4x\text{-}1}$($2^{4x\text{-}1}$ In2 (4)) + -csc e^{5x+6} (5)/cot e^{5x+6}
F^1 = 4 $2^{4x\text{-}1}$In2sec$^{2\,(2}$4x-1) – 5 e^{5x+6}csc e^{5x+6}/cot e^{5x+6}

8. F(x)= sec (2^x) – in (cos e^{4x})

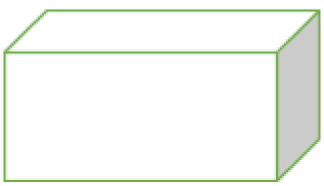
F^1= sec 2^xtan(Dx 2^x) - $\frac{Dx\ cose^{4x}}{coscos\ e^{4x}}$

F^1= sec 2^x tan2^x in 2 - $\frac{-sen\ e^{4x}Dxe^{4x}}{coscos\ e^{4x}}$

F^1= sec 2^x tan2^x in 2 + tan e^{4x} $(4e^{4x})$

APLICACIÓN DE MÁXIMOS Y MÍNIMOS

Se desea construir una caja con base cuadrada de capacidad de 32000 cm^3 de capacidad, de tal manera que el material a utilizar sea el mínimo, hallar sus dimensiones:



V= l.a.h V= x^2.h

V= 3200 cm^3 32000= x^2.h h=$\frac{32000}{x^2}$

A_T=4xh+x^2 $4x(\frac{32000}{x^2})+x^2$ f(x)=$\frac{128000}{x}$+x^2

A_T= 4(40)(20)+$(40)^2$ h=$\frac{32000}{40^2} = \frac{32000}{1600} = 20$ 128000x^{-1}+2x

A_T=3200+1600

$\frac{-128000}{x^2} + 2x = 0$

A_T=4800cm^2 $2x = \frac{128000}{x^2}$ $2x^3$=128000

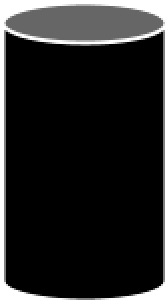
$x^3 = \frac{128000}{2}$

$x^3 = 64000$ $x = \sqrt[3]{64000}$ x=40cm

Dimensiones: base de 40×40cm

Altura de 20cm

Se desea construir un recipiente cilindrico de metal sin tapa que tenga una superficie total de $120cm^2$ determinar las dimensiones de tal forma que se obtenga el volumen màximo



$\pi r^2 + 2\pi r h$=120 $h = \frac{120-\pi r^2}{2\pi r}$

$v = (\pi r^2)\frac{120-\pi r^2}{2\pi r}$

$v = 60r - \frac{\pi r^3}{2}$ $v^1 = 60 - \frac{3}{2}\pi r^2 = 0$

$r^2 = \frac{2(60)}{3\pi}$ $r^2 = \frac{40}{\pi}$ $r = \sqrt{\frac{40}{\pi}}$ $r = \sqrt{12.7}$ $r = 3.56$

maximo

$v^{II}(3.56) = - 3(\pi)(3.56) = - 33.5$ $h = \frac{120-\pi(3.56)^2}{2\pi(3.56)}$

$h = \frac{80.18}{22.36}$ $h = 3.56$

$v = 60r - \frac{\pi r^3}{2}$ $v = 60(3.56) - \frac{\pi(3.56)^3}{2}$ $v = 213.6 - \frac{141.74}{2}$

$v = 213.6 - 70.87$ $v = 142.72cm^3$