4.3 Trig. Derivatives & Chain Rule I

Wednesday, June 12, 2019 7:14 AM

$y = 4\sin x$

$\frac{dy}{dx} = 4\cos x$

$y = \underbrace{4x}_{1^{ST}}\underbrace{\sin x}_{2^{ND}}$

product rule

$\frac{dy}{dx} = (4x)(\cos x) + (\sin x)(4)$

1ST D2ND + 2ND D1ST

$y = \sin(\underbrace{4x}_{\text{inner}})$ (outer)

$\frac{dy}{dx} = \cos(4x)\cdot 4$

D-OUTER · D-inner

$4\cos(4x)$

ex

$y = \tan(x^2+5)$

stays | some

$\frac{dy}{dx} = \sec^2(x^2+5)\cdot 2x$

D-OUTER D-inner

$2x\sec^2(x^2+5)$

$y = \sin^2 x$

$y = (\sin x)^2$

stays | some

$\frac{dy}{dx} = 2(\sin x)^1\cdot\cos x$

D-OUTER D-inner

$y = \cos^4(3x+4)$

$y = (\cos(3x+4))^4$

some

some

$\frac{dy}{dx} = 4(\cos(3x+4))^3\cdot(-\sin(3x+4))\cdot 3$

$y = \sin(\tan(5x^2-2x+6))$

$\frac{dy}{dx} = \cos(\underbrace{\tan(5x^2-2x+6)}_{\text{(some)}})\cdot(\sec^2(\underbrace{5x^2-2x+6}_{\text{(some)}}))\cdot(10x-2)$

D-OUTER · D-MIDDLE · D-INNER

$$\frac{dy}{dx} = 4\left(\cos(3x+4)\right)^{3} \cdot \left(-\sin(3x+4)\right) \cdot 3$$

D-OUTER · D-MIDDLE · D-INNER

$$-12\cos^{3}(3x+4)\sin(3x+4)$$