3.7 Chain Rule II

Wednesday, June 12, 2019 7:15 AM

Power Rule: $\#\, x^{\text{power}}$

Product Rule: $(1^{ST})(2^{ND})$

Quotient Rule: $\frac{\text{TOP}}{\text{BOTTOM}}$

Chain Rule: $(\text{INNER})^{\text{OUTER}}$

Chain Rule Inside Product Rule

$f(x) = 5(4x+1)^4 \cdot (x^2 - x + 6)$

$f'(x) = (1^{ST}) \cdot (D\text{-}2^{ND}) + (2^{ND})(D\text{-}1^{ST})$

Chain Rule: (D-OUTER) (D-INNER)

$f'(x) = 5(4x+1)^4 \cdot (2x-1) + (x^2 - x + 6)\, 20(4x+1)^3 \cdot 4$

Product Rule Inside Chain Rule

$f(x) = \left[(x^2+4x-1)\cdot(2x+3)\right]^5$

$f(x) = (\text{D-OUTER})\cdot(\text{D-INNER})$

Product Rule

$f'(x) = 5\left[(x^2+4x-1)(2x+3)\right]^4 \cdot \left[(x^2+4x-1)(2) + (2x+3)(2x+4)\right]$

(1ST) (D·2ND) + (2ND) · (D1ST)

Chain Rule Inside Quotient Rule

$f(x) = \frac{x^2+3x+4}{(5x-2)^3}$

Chain Rule

$f'(x) = \frac{(B)\cdot(DTop) - (T)\cdot(DB)}{(B)^2}$

(D-OUTER) (D-INNER)

$f'(x) = \frac{(5x-2)^{1}\cdot(2x+3) - (x^2+3x+4)\,3(5x-2)^{2}\cdot 5}{(5x-2)^{4}}$

$f'(x) = \frac{(5x-2)(2x+3) - 15(x^2+3x+4)}{(5x-2)^4}$

Quotient Rule Inside Chain Rule

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

Quotient Rule

$f'(x) = (\text{D-OUTER})(\text{D-INNER})$

$f'(x) = 4\left(\frac{2x^2-5}{3x+1}\right)^3 \cdot \frac{(3x+1)(4x) - (2x^2-5)(3)}{(3x+1)^2}$

$f(x) = \frac{}{(5x-2)^4}$ 2