

Solutions to chain rule problems

1. $f'(x) = \frac{4x-7}{2x^2-7x+20} \cdot x \cdot \sin$
2. $f'(x) = e^{-x^3+x^2-2x} \cdot (-3x^2+2x-2)$
(chain rule)
3. $f'(x) = [\sec^2(1-x^2)] \cdot (-2x)$
4. $f'(x) = 6x + \frac{2}{2x+6}$
5. $f'(x) = -e^{6x^2+x^{-1}} (12x - x^{-2})$
6. $f'(x) = 2 \cos 2x + (\sin(1-x))(-1)$
7. $f'(x) = 2e^{1-x^4} + (2x-1)e^{1-x^4} (-4x^3)$
(product rule)
8. $f'(x) = \ln(x^{-1} + \sqrt{x}) + x \frac{(-x^{-2} + \frac{1}{2}x^{-1/2})}{x^{-1} + \sqrt{x}}$
(product rule)
9. $f'(x) = \frac{3(\cos(3x-1))\sqrt{x} - (\sin(3x-1))(\frac{1}{2}x^{-1/2})}{x}$
(quotient rule)
10. $f'(x) = 2 \cos(4x) (-\sin 4x) \cdot 4 - 2 \tan 2x (\sec^2 2x) (2)$
11. $f'(x) = \frac{1}{2} (\ln(11x-1))^{-1/2} \cdot \frac{11}{11x-1}$

$$12. f'(x) = 6x^5 - \frac{(\cos 5x)(5)}{\sin 5x}$$

$$13. f'(x) = \frac{2e^{2x-3}(6x^2-5x+1) - e^{2x-3}(12x-5)}{(6x^2-5x+1)^2}$$

(quotient rule)

$$14. f'(x) = \sec(9x - \ln x) \tan(9x - \ln x) (9 - \frac{1}{x})$$