Chain Rule Practice Worksheet with Answers

Answers

1. $f'(x) = 2(2x+1) \cdot 2 = \mathbf{4(2x+1)}$

2. $f'(x) = 6(5x-7)^5 \cdot 5 = \mathbf{30(5x-7)^5}$

3. $f'(x) = \mathbf{5e^{5x}}$

4. $f'(x) = \frac{1}{2}e^{2x} \cdot 2 = \mathbf{e^{2x}}$

5. $f'(x) = \mathbf{-2\sin(2x)}$

6. $f'(x) = \mathbf{-\sin(\sin(x)) \cdot \cos(x)}$

7. $f'(x) = \mathbf{\cos(x^2) \cdot 2x}$

8. $f'(x) = \frac{4}{\cos^2(4x)} = \mathbf{4\sec^2(4x)}$

9. $f'(x) = \mathbf{\frac{3}{3x+1}}$

10. $f'(x) = \mathbf{\frac{1}{2}x^{-\frac{1}{2}}}$

11. $f'(x) = \frac{1}{2}(3x^2+3)^{-\frac{1}{2}} \cdot 6x = \mathbf{(3x^2+3)^{-\frac{1}{2}} \cdot 3x}$

12. $f'(x) = 3(3x^2 + 2x)^2 \cdot (6x + 2)$

13. $f'(x) = \frac{1}{2}(4x^2 + 1)^{-\frac{1}{2}} \cdot 8x = (4x^2 + 1)^{-\frac{1}{2}} \cdot 4x$

14. $f'(x) = e^{2x^3 + 5x} \cdot (6x^2 + 5)$

15. $f'(x) = 16x \cdot \cos(4x^2 + 1)^2 \cdot (4x^2 + 1)$

16. $f'(x) = \sec^2(3x^2 - 5x) \cdot (6x - 5)$

17. $f'(x) = \csc^2(e^x + x^2) \cdot (e^x + 2x)$

18. $f'(x) = -x \cdot x^{-2} = -\frac{x}{x^2} = -\frac{1}{x}$

19. $f'(x) = -\frac{1}{2}(2x - \frac{1}{2})^{-\frac{3}{2}} \cdot 2 = -(2x - \frac{1}{2})^{-\frac{3}{2}}$

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

21. $f'(x) = \cos(2x^8 + 4x^2 + 3x) \cdot (16x^7 + 8x + 3)$

22. $f'(x) = 5^{4x+2} \cdot \ln(5) \cdot 4$