

Chain Rule

Example

1. Find $\frac{d}{dx}f(g(x))$.

Problems

2. Find $(\cos(x^2))'$.
3. Find the derivative of $(\tan x)^2$.
4. Find the derivative of $\frac{x}{1 - \sin x}$.
5. Find the derivative of $\ln(\sin x)$.
6. Find the derivative of $\sec(x)$.
7. Find the derivative of $\sin(\cos x)$.
8. Find the derivative of $e^{\sin(2x)}$.
9. Find the derivative of $\tan(e^{\sin x})$.
10. Find the derivative of $\cos(\tan(3x))$.
11. Find the derivative of $((2x + 3)^5 + e^x)^{99}$.
12. Find the derivative of $\arctan(\cos x)$.
13. Find the derivative of $\tan(\arctan(x))$.

Derivative of Inverse Functions

Example

14. Find the derivative of $f^{-1}(x)$.

Problems

15. Let $f(x) = x^3 + 7x + 2$. Find the tangent line to $f^{-1}(x)$ at $(10, 1)$.
16. Let $f(x) = x^5 + 3x^3 + 7x + 2$. Find the tangent line to $f^{-1}(x)$ at $(13, 1)$.
17. Let $f(x) = e^{-2x} - 9x^3 + 4$. Find the tangent line to $f^{-1}(x)$ at $(5, 0)$.
18. Let $f(x) = x^7 + 2x + 9$. Find the tangent line to $f^{-1}(x)$ at $(12, 1)$.
19. Let $f(x) = x^{5/3}e^{x^2}$. Find the tangent line to $f^{-1}(x)$ at $(e, 1)$.
20. Let $f(x) = \frac{-e^{-3x}}{x^2 + 1}$. Find the tangent line to $f^{-1}(x)$ at $(-1, 0)$.
21. Let $f(x) = 7x + \sin(2x)$. Find the tangent line to $f^{-1}(x)$ at $(0, 0)$.
22. Let $f(x) = x^3 + 8x + \cos(3x)$. Find the tangent line to $f^{-1}(x)$ at $(1, 0)$.
23. Let $f(x) = 10x + (\arctan(x))^2$. Find the tangent line to $f^{-1}(x)$ at $(0, 0)$.
24. Let $f(x) = 7x^3 + (\ln x)^3$. Find the tangent line to $f^{-1}(x)$ at $(7, 1)$.
25. Let $f(x) = x^3 + x - 2$. Find the tangent line to $f^{-1}(x)$ at $(0, 1)$.
26. Let $f(x) = x^3 + 2x - 8$. Find the tangent line to $f^{-1}(x)$ at $(4, 2)$.