

Derivatives of Inverse Functions

Find the inverse $g = f$ inverse, then differentiate the explicit inverse directly. State the original, inverse, and derivative domains.

1. Find g and g' .

$f(x) = \frac{2 \cdot x - 7}{4}$

Original domain: all real numbers.

2. Find g and g' .

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

Original domain: $x \geq 1$.

3. Find g and g' .

$f(x) = \frac{-3 \cdot x - 3}{x - 4}$

Original domain: $x \neq 4$.

4. Find g and g' .

$f(x) = \log_5 \left(3 \cdot x - 2 \right)$

Original domain: $x > 2/3$.

5. Find g and g' .

$f(x) = \frac{10^x + 4}{-4}$

Original domain: all real numbers.

6. Find g and g' .

$f(x) = \frac{5 \cdot x - 9}{3}$

Original domain: all real numbers.

7. Find g and g' .

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

Original domain: all real numbers.

8. Find g and g' .

$f(x) = \frac{-1 \cdot x + 1}{3 \cdot x + 3}$

Original domain: $x \neq -1$.

9. Find g and g' .

$f(x) = \log_5 \left(4 \cdot x - 4 \right)$

Original domain: $x > 1$.

10. Find g and g' .

$f(x) = \frac{10^x - 3}{5}$

Original domain: all real numbers.

11. Find g and g' .

$f(x) = \frac{4 \cdot x - 1}{3}$

Original domain: all real numbers.

12. Find g and g' .

$f(x) = 3 \cdot \left(x + 4 \right)^4 + 1$

Original domain: $x \leq -4$.

13. Find g and g' .

$f(x) = \frac{-2}{x - 3}$

Original domain: $x \neq 3$.

14. Find g and g' .

$f(x) = \log_3 \left(5 \cdot x + 5 \right)$

Original domain: $x > -1$.

15. Find g and g' .

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

Original domain: all real numbers.

Find g first, then differentiate g directly. f inverse is a function, not $1/f$.
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Page 1 of 2

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Find the inverse $g = f$ inverse, then differentiate the explicit inverse directly. State the original, inverse, and derivative domains.

16. Find g and g'.

$f(x) = \frac{6 \cdot x + 8}{5}$

Original domain: all real numbers.

17. Find g and g'.

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

Original domain: $x \leq -2$.

18. Find g and g'.

$f(x) = \frac{4 \cdot x - 3}{2 \cdot x}$

Original domain: $x \neq 0$.

19. Find g and g'.

$f(x) = \log_{10}(-2 \cdot x - 2)$

Original domain: $x < -1$.

20. Find g and g'.

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

Original domain: all real numbers.

21. Find g and g'.

$f(x) = \frac{6 \cdot x - 8}{3}$

Original domain: all real numbers.

22. Find g and g'.

$f(x) = (x - 1)^3$

Original domain: all real numbers.

23. Find g and g'.

$f(x) = \frac{-2 \cdot x + 4}{x + 4}$

Original domain: $x \neq -4$.

24. Find g and g'.

$f(x) = \log_{10}(3 \cdot x - 5)$

Original domain: $x > 5/3$.

25. Find g and g'.

$f(x) = \frac{10^x + 4}{-2}$

Original domain: all real numbers.

26. Find g and g'.

$f(x) = \frac{3 \cdot x + 4}{3}$

Original domain: all real numbers.

27. Find g and g'.

$f(x) = 3 \cdot (x - 3)^4$

Original domain: $x \geq 3$.

28. Find g and g'.

$f(x) = \frac{x + 5}{3 \cdot x + 1}$

Original domain: $x \neq -1/3$.

29. Find g and g'.

$f(x) = \log_5(5 \cdot x - 4)$

Original domain: $x > 4/5$.

30. Find g and g'.

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

Original domain: all real numbers.