Derivative of an Inverse Function

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Let f be a differential function. If f possesses an inverse function f^{-1}, then f^{-1} is differentiable at any x for which $f'\left(f^{-1}(x)\right) \neq 0$. Therefore, $\left(f^{(-1)}\right)'(x) = \dfrac{1}{f'\left(f^{(-1)}(x)\right)}$.

To find $f'\left(f^{-1}(b)\right)$ for a point (a, b) on $f(x)$.

1. Find f'.
2. If you are only given b, set $b = f(x)$ to find a .
3. Find $f'(a)$.
4. $f'\left(f^{-1}(b)\right) = \dfrac{1}{f'(a)}$

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1. If g is the inverse function of f and $f(3) = 2$, find the value of $g'(2)$ for $f(x) = \dfrac{x^3}{4} + x - 1$.

2. Let f be the function defined by $f(x) = x^5 + 2x - 1$. If $g(x) = f^{-1}(x)$ and (2, 1) is on f, what is the value of $g'(1)$?

**3. Let f be the differentiable function such that $f(3)=15$, $f(6)=3$, and $f'(3)= -8$, and $f'(6)= -2$. The function g is differentiable and $g(x) = f^{-1}(x)$ for all x. What is the value of $g'(3)$?