

1. Let f be the function defined by $f(x) = x^3 + 7x + 2$. If $g(x) = f^{-1}(x)$ and $f(1) = 10$, what is the value of $g'(10)$?
2. Let f be the function defined by $f(x) = x^5 + 3x^3 + 7x + 2$. If $g(x) = f^{-1}(x)$ and $f(1) = 13$, what is the value of $g'(13)$?
3. Let f be the function defined by $f(x) = 7(x+1)^3 + \sin^3 x$. If $g(x) = f^{-1}(x)$ and $f(0) = 7$, what is the value of $g'(7)$?
4. Let f be the function defined by $f(x) = x^7 + 2x + 9$. The point $(1, 12)$ is on the graph of f . If $g(x) = f^{-1}(x)$, find $g'(12)$.
5. The functions f and g are differentiable. Given that $g(x) = f^{-1}(x)$, $f(1) = 3$, and $f'(1) = -5$, find $g'(3)$.
6. The functions f and g are differentiable. Given that $g(x) = f^{-1}(x)$, $f(2) = 4$, $f(4) = -6$, $f'(2) = 7$, and $f'(4) = 11$, find $g'(4)$.
7. Find $\frac{d^2y}{dx^2}$ for $y = \arcsin(3x+2)$.
8. Given the function $y = \arctan(\cos x)$. Find the value of $f''\left(\frac{\pi}{3}\right)$.