AP Calculus AB Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **Find the derivative of *f* −1 for each of the following functions using implicit differentiation:**

* 1. *f* (*x*) = 5*x*3 + *x* −7

* 1. *f* (*x*) = 2*x*5 + *x*3 +1

* 1. *f* (*x*) = 5*x* − sin(2*x*)

1. **Evaluating the Derivatives of Inverse Functions**

* 1. Find the derivative of the inverse of *f* (*x*) = *x*3 + 7*x* + 2 at the point where *f* −1(10) = 1.

* 1. Let *f* be the function defined by *f* (*x*) = *x*3 + *x*. If *g*(*x*) = *f* −1(*x*) and *g*(2) = 1, what is the value of *g* ' (2) ?

* 1. Let *f* be the function defined by *f* (*x*) = *x*3 + 8*x* + cos(3*x*) . If *g*(*x*) = *f* −1(*x*) and g(1) = 0 , find the value of *g*'(1) .

* 1. If *f* (*x*) = *x*5 + 3*x* + 2 and *g*(*x*) = *f* −1(*x*) , find *g*’(2) .

* 1. Find $(f^{-1})’ (-1)$ if *f* (*x*) = 3*x* − cos *x*.

* 1. Find $(f^{-1} )’ (5)$ if *f* (*x*) = *x*3 + 2*x* + 5 .
	2. If g(7) = 3 and g’(3) = 5/6 and g’(7) = ¾, then $\left(g^{-1}\right)^{'}\left(3\right)=$
	3. A function$ f(x)$ and its derivative take on the values shown in the table. If $g(x)$ is the inverse of $f(x)$, find $g’(6).$

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| x | $$f\left(x\right)$$ | $$f'(x)$$ |
| 2 | 6 | 1/3 |
| 6 | 8 | 3/2 |