

Name: \_\_\_\_\_

Derivatives of Inverse Functions

1. Given  $f(1) = 2$ ,  $f(2) = 5$ ,  $f'(1) = 3$ ,  $f'(2) = 4$ , find  $(f^{-1})'(2)$

2. Given the function values in the table below.

Find each of the following

a.  $(f^{-1})'\left(\frac{1}{2}\right)$

b.  $(f^{-1})'\left(\frac{3}{2}\right)$

c.  $(f^{-1})'(-1)$

x	-2	-1	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{2}$
f(x)	-1	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{2}$	3
f'(x)	6	-2	$\frac{5}{4}$	$\frac{5}{4}$	2.5

3. If  $f(x) = 3x - 5x^3$ , find  $\frac{d}{dx}[f^{-1}(x)]\Big|_{x=2}$

4.  $f(x) = x^3 - 3x^2 + 8x + 5$ , find  $\frac{d}{dx}[f^{-1}(x)]\Big|_{x=4}$

5.  $f(x) = x^7 - 2x^5 + 2x^3$ , find  $\frac{d}{dx}[f^{-1}(x)]\Big|_{x=2}$

6. If  $h(x)$  is the inverse function of  $f(x) = \frac{1}{x}$ , then  $h'(3) =$

- A. -9      B.  $-\frac{1}{9}$       C.  $\frac{1}{9}$       D. 3      E. 9