g is an inverse f
or
$g(f(x)) = f(g(x)) = x$

Inverse Practice

Name

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

g is inverse of f

$g'(3) = \dfrac{1}{f'(6)}$

3 is the input of g, therefore output of f

(A) $-\frac{1}{2}$

(B) $-\frac{1}{8}$

(C) $\frac{1}{6}$

(D) $\frac{1}{3}$

(E) The value of $g'(3)$ cannot be determined from the information given.

2. The function h is given by $h(x) = x^5 + 3x - 2$ and $h(1) = 2$. If h^{-1} is the inverse of h, what is the value of $(h^{-1})'(2)$?

input

$= \dfrac{1}{h'(1)}$

input of h^{-1}

output of h

$2 = x^5 + 3x - 2$
$0 = x^5 + 3x - 4$

(A) $\frac{1}{83}$

(B) $\frac{1}{8}$

(C) $\frac{1}{2}$

(D) 1

(E) 8

$h'(x) = 5x^4 + 3$
$h'(1) = 5(1)^4 + 3$
$= 5 + 3 = 8$

3. If f(x) = sin x + 2x + 1 and g is the inverse function of f, what is the value of $g'(1)$?

input of inverse, so output of function

$1 = \sin x + 2x + 1$
$0 = \sin x + 2x$
$x = 0$

$g'(1) = \dfrac{1}{f'(0)} = \dfrac{1}{3}$

$f'(x) = \cos x + 2$

$f'(0) = \cos(0) + 2 = 1 + 2 = 3$