# 4.3 Day 2

Wednesday, October 12, 2016 7:24 AM

AP Calculus AB
Opener for 4.3 Day 2

Name_____

1. $f(x)=x^2$ Find:

a. $f(4)=16$ (4, 16)

b. $f'(4)=8$

2. $g(x)=\sqrt{x}$ Find:

$x^{\frac{1}{2}}$

$\frac{1}{2}x^{-\frac{1}{2}}$

a. $g(16)=4$ (16, 4)

b. $g'(16)=\frac{1}{8}$

$\frac{1}{2}(16)^{-\frac{1}{2}}$

$\frac{1}{2\sqrt{16}}=\frac{1}{8}$

What is the relationship between $f(x)$ *and* $g(x)$?

inverses

What is the relationship between $f'(4)$ *and* $g'(16)$?

reciprocals

3. $h(x)=x^3$ Find:

a. $h(2)=8$ (2, 8)

b. $h'(2)=12$

4. $j(x)=\sqrt[3]{x}$ Find:

$x^{\frac{1}{3}}$

$\frac{1}{3}x^{-\frac{2}{3}}$

a. $j(8)=2$ (8, 2)

b. $j'(8)=\frac{1}{12}$

$\frac{1}{3}(8)^{-\frac{2}{3}}$

$\frac{1}{3\sqrt[3]{8^2}}=\frac{1}{3}\cdot\frac{1}{4}$

What is the relationship between $h(x)$ *and* $j(x)$?

inverses

What is the relationship between $h'(2)$ *and* $j'(8)$?

reciprocals

5. The slope at the point $(a, f(a))$ on the function $f(x)$ is given by $f'(a)$. What is the corresponding point on $f^{-1}(x)$ and how is the slope at that point related to $f'(a)$?

point on $f^{-1}(x)$: $(f(a), a)$

slope: $f^{-1\prime}(f(a))=\frac{1}{f'(a)}$

Example from AP Exam:

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 $g'(3)$?

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.

$g: (3, \quad)$

$f: (6, 3)$

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