Related Questions with Solutions

Questions

Quetion: 01

Let g is the inverse function of f and $f'(x) = \dfrac{x^{10}}{(1+x^2)}$. If $g(2) = a$ then $g'(2)$ is equal to

A. $\dfrac{5}{2^{10}}$

B. $\dfrac{1+a^2}{a^{10}}$

C. $\dfrac{a^{10}}{1+a^2}$

D. $\dfrac{1+a^{10}}{a^2}$

Solutions

Solution: 01

$f[g(x)] = x \quad \Rightarrow \quad f'[g(x)] \cdot [g'(x)] = 1 \quad \Rightarrow \quad f'(a) \cdot g'(2) = 1 \text{ [putting } x = 2]$

given, $f'(a) = \frac{a^{10}}{1+a^2}; g'(2) = \frac{1+a^2}{a^{10}}$

Alternative:

g [f [x]] = x
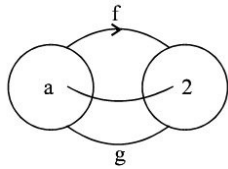
g' [f [x]] · f ' [x] = 1

     now g [2] = a   So, f [a] = 2

      g and f are inverse of each other

     now f [x] = 2   So, g [2] = x = a

     Now,   g ' [2] . f ' [a] = 1

$g'(2) = \dfrac{1}{f'(a)} = \dfrac{1+a^2}{a^{10}}$

Correct Options

Answer:01

Correct Options: B