MATHS

BOOKS - CENGAGE

METHODS OF DIFFERETIATION

Question Bank

1. Let $f : (-5, 5) \to R$ be a differentiable function with f(4) = 1, $f'(4) = 1$, $f(0) = -1$ and f^(')(0) = 1, If g(x) = f(2f^(2)(x)+2))^(2), $then$ - g^(')(0)` equals

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2.

Let $e^y = \dfrac{\sqrt{1+\alpha} + \sqrt{1-\alpha}}{\sqrt{1+\alpha} - \sqrt{1-\alpha}}$ and $\tan\dfrac{x}{2} = \sqrt{\dfrac{1-\alpha}{1+\alpha}}$, $\alpha \in [-1, 0] \cup (0, 1$

3. If $y = y(x)$ and it follows the relation $4xe^{xy} = y + 5\sin^2 x$, then $y'(0)$ is equal to _____

4. $\dfrac{1}{\sqrt{x+3} - \sqrt{x-4}}$

5. Let x = f(t) and y = g(t), where x and y are twice differentiable function If $f'(0) = g'(0) = f''(0) = 2, g(0) = 6$, then the value of $\left(\dfrac{d^2 y}{dx^2} \right)_{t=0}$

is equal to

6. If f(x) is twice differentiable and $f''(0) = 3$, then

$$\lim_{x \to 0} \frac{2f(x) - 3f(2x) + f(4x)}{x^2}$$ is

7. If $f(x) = 2x^3 + 7x - 5$ and $g(x) = f^{-1}(x)$, then reciprocal of $g'(4)$ is equal to

8. If $e^y = e^x \cdot x^{-y}$, the value of $\dfrac{dy}{dx}\bigg|_{x=e}$ is

9. Suppose the function f(x)-f(2x) has the derivative 5 at x =1 and derivative 7 at x = 2. The derivative of the function f(x)-f(4x) at x = 1, has the value equal to

10. Let h(x) be differentiable for all x and let

$f(x) = (kx = e^x)h(x) where k is some constant. If h(0) = 5, h^('}(0) =$

-2 and f^(')(0) =18` then the value of k is equal to

11. If f and g are differentiable functions such that $g'(a) = 2$ and g(a) = b

and if fog is an identity function then $f'(b)$ has the value equal 'to

12. If $\phi(x) = x \cdot \sin x$ then $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{\phi(x) - \phi\left(\frac{\pi}{2}\right)}{x - \frac{\pi}{2}} =$

13. If $(\cos x)^y = (\cos y)^x$, "then" $\frac{dy}{dx}$ is equal to