**Related Questions with Solutions**

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**Questions**

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**Quetion: 01**

Let $f(x) = x + \sin x$. Suppose $g$ denotes the inverse function of $f$ . The value of $g'\left(\dfrac{\pi}{4} + \dfrac{1}{\sqrt{2}}\right)$ has the value equal to

A. $\sqrt{2} - 1$

B. $\dfrac{\sqrt{2} + 1}{\sqrt{2}}$

C. $2 - \sqrt{2}$

D. $\sqrt{2} + 1$

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**Solutions**

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**Solution: 01**

$f(x) = y = x + \sin x$

$\dfrac{dy}{dx} = 1 + \cos x \qquad$ where $y = \frac{\pi}{4} + \frac{1}{\sqrt{2}} = x + \sin x \Rightarrow x = \frac{\pi}{4}$

$g'(y) = \dfrac{dx}{dy} = \dfrac{1}{1 + \cos x}$

$\therefore \text{g}'\left(\dfrac{\pi}{4} + \dfrac{1}{\sqrt{2}}\right) = \dfrac{1}{1 + (1/\sqrt{2})} = \dfrac{\sqrt{2}}{\sqrt{2} + 1} = \sqrt{2}(\sqrt{2} - 1) = 2 - \sqrt{2}$

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**Correct Options**

**Answer:01**

**Correct Options: C**