

09/06/06

Let $h(x) = \sin(x)\cos(x)$. Evaluate $h'(\pi)$ and express your answer in simplified form.

$$h'(x) = \sin(x)(-\sin(x)) + \cos(x)\cos(x)$$

- Using the Product Rule,
and $\frac{d}{dx}[\cos(x)] = -\sin(x)$,
 $\frac{d}{dx}[\sin(x)] = \cos(x)$.

$$\Rightarrow h'(x) = -\sin^2(x) + \cos^2(x)$$

- You may plug in the value of π now or you may go further.

$$\Rightarrow h'(x) = \cos(2x)$$

- $\cos(2u) = \cos^2(u) - \sin^2(u)$
{ Trig. Identity }

$$\Rightarrow h'(\pi) = \cos(2\pi) = 1$$

$$\Rightarrow \boxed{h'(\pi) = 1}$$

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