1 Question: find the slope of function $sin(x)^{cos(x)}$ in point $\frac{\pi}{2}$.

As we know the derivative of a function tells us what is the slope of this function in any point. The easiest way to solve this task is to calculate the derivative of $sin(x)^{cos(x)}$ and see what is the value of this derivative in point $\frac{\pi}{2}$

$$f(x) = sin(x)^{cos(x)} = e^{ln(sin(x)^{cos(x)})} = e^{cos(x)\cdot ln(sin(x))} \tag{1}$$

$$f'(x) = e^{cos(x)\cdot ln(sin(x))} \cdot \frac{d}{dx}(cos(x) \cdot ln(sin(x))) \tag{2}$$

$$f'(x) = e^{cos(x)\cdot ln(sin(x))} \cdot \left(-sin(x) \cdot ln(sin(x)) + \frac{cos^2(x)}{sin(x)}\right) \tag{3}$$

Looks scary but we need to just set $\frac{\pi}{2}$ as an x

$$f'(\frac{\pi}{2}) = e^{cos(\frac{\pi}{2})\cdot ln(sin(\frac{\pi}{2}))} \cdot \left(sin(\frac{\pi}{2}) \cdot ln(sin(\frac{\pi}{2})) + \frac{-cos^2(\frac{\pi}{2})}{sin(\frac{\pi}{2})}\right) \tag{4}$$

$$f'(\frac{\pi}{2}) = e^0 \cdot (0 + 0) = 0 \tag{5}$$