

Note. This is an open brain, open HHA, closed book, quiz. Please fill in the blanks. Show no work. Write expressions unambiguously e.g, “ $1/a+b$ ” should be bracketed either $[1/a]+b$ or $1/[a+b]$. (Be careful with **negative** signs!)

Differentiation Facts. You may use that $\sin' = \cos$ and $\cos' = -\sin$. Also $\log'(t) = 1/t$.

Q2a: Prof. King believes that writing in complete, coherent sentences is crucial in communicating Mathematics, improves posture, and whitens teeth. one:
True! **Yes!** **What's a sentence?**

a Define a product function $g := \sin \cdot \log$. So $g'(t) = \underline{\hspace{2cm}}$

b Recall that $\tan = \sin/\cos$. Thus $\tan'(\theta) = \underline{\hspace{2cm}}$

c Let $\alpha(x) := e^{[2x^7 + 7^x]}$. Then $\alpha'(x) = \underline{\hspace{2cm}}$

d Below, f and g are differentiable fncs with

$$\begin{aligned} f(2) &= 3, & f'(2) &= 19, & f(3) &= 5, & f'(3) &= 17, \\ g(2) &= 11, & g'(2) &= \frac{1}{2}, & g(3) &= 13, & g'(3) &= 7, \\ g(5) &= 23, & g'(5) &= 29. \end{aligned}$$

Define the composition $h := g \circ f$. Then

$$h(2) = \underline{\hspace{2cm}}; h'(2) = \underline{\hspace{2cm}}.$$

Please write each answer as a product of numbers; **do not** multiply out.

Q2a: 50pts

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