

Computing $\frac{d}{dx} \left[\csc(x) * \left[3^x + \tan^3 \left(e^{17x^2 + \sqrt{x}} \right) \right]^4 \right] :$

first, the "shape" of this function is

$$a(x) * b \left(c(x) + d \left(f \left(g \left(k \cdot h(x) + j(x) \right) \right) \right) \right)$$

where

$a(x) = \boxed{}$

$b(x) = \boxed{}$

$c(x) = \boxed{}$

$d(x) = \boxed{x^3}$

$f(x) = \boxed{}$

$g(x) = \boxed{}$

$k = \boxed{17}$

$h(x) = \boxed{}$

$j(x) = \boxed{}$

calculate:

$a'(x) = \boxed{}$

$b'(x) = \boxed{}$

$c'(x) = \boxed{}$

$d'(x) = \boxed{3x^2}$

$f'(x) = \boxed{}$

$g'(x) = \boxed{}$

$h'(x) = \boxed{}$

$j'(x) = \boxed{}$

$$\frac{d}{dx} \csc(x) * \left(3^x + \tan^3(e^{17x^2 + \sqrt{x}}) \right)^4$$

$$= \boxed{} * \left(3^x + \tan^3(e^{17x^2 + \sqrt{x}}) \right)^4 + \boxed{} * \boxed{\star}$$

$\hookrightarrow a'(x)$
 $\hookrightarrow a(x)$

$$\frac{d}{dx} \left(3^x + \tan^3(e^{17x^2 + \sqrt{x}}) \right)^4 = \boxed{} * \boxed{\star}$$

$\hookrightarrow b'(3^x + \tan^3(e^{17x^2 + \sqrt{x}}))$

$$\frac{d}{dx} \left(3^x + \tan^3(e^{17x^2 + \sqrt{x}}) \right) = \boxed{} + \boxed{} * \boxed{\star}$$

$\hookrightarrow c'(x)$
 $\hookrightarrow d'(\tan(e^{17x^2 + \sqrt{x}}))$

$$\frac{d}{dx} \tan(e^{17x^2 + \sqrt{x}}) = \boxed{} * \boxed{\star}$$

$\hookrightarrow f'(e^{17x^2 + \sqrt{x}})$

$$\frac{d}{dx} e^{17x^2 + \sqrt{x}} = \boxed{} * \boxed{}$$

$\hookrightarrow g'(17x^2 + \sqrt{x})$
 $\hookrightarrow \frac{d}{dx} (17x^2 + \sqrt{x})$

Put it all back together:

$$\frac{d}{dx} \csc(x) * \left[3^x + \tan^3(e^{17x^2 + \sqrt{x}}) \right]^4$$

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