Unit n°102

Aus gegebenen Anlass -
Ein kleines mathematisches Versteckspiel

For given reason - A small mathematical hide-and-seek

The tangent line to the curve $y = f\left(x\right)$ at the point

$$(x_0, y_0) = \left(\frac{\left(\frac{x}{f(x)} \right)^{(0)}}{\left(\frac{1}{f(x)} \right)^{(0)}}, \frac{\left(\frac{f(x)}{x} \right)^{(0)}}{\left(\frac{1}{x} \right)^{(0)}} \right)_{x = x_0} \tag{1}$$

has the intercept equation

$$\frac{x}{a} + \frac{y}{b} = 1 \tag{2}$$

with the *x*-axis intercept *a* and the *y*-axis intercept *b*, respectively, given by

$$(a, b) = \left(\frac{\left(\frac{x}{f(x)} \right)^{(1)}}{\left(\frac{1}{f(x)} \right)^{(1)}}, \frac{\left(\frac{f(x)}{x} \right)^{(1)}}{\left(\frac{1}{x} \right)^{(1)}} \right)_{x = x_0} . \tag{3}$$

Here is

$$(f(x))^{(n)} = f^{(n)}(x) = \begin{cases} f(x) \text{ for } n = 0 \\ \dfrac{d^n f(x)}{dx^n} \text{ for } n \in \mathbb{N} \end{cases} \qquad (4)$$

Discussion

Is this hide-and-seek idea **“**a mayfly or a tool to strike oil”? To answer on this question try to

** extend it to …
** find similar approaches to “normalize” formula expressions.