Calculus

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March 3, 2020

1 Calculation

We will attempt to simplify the following expression:

$$\frac{\mathrm{d}}{\mathrm{d}x}\left(x^2\right)$$

We can use the *power rule* to rewrite our expression as:

$$\left(x^2\right)\cdot\frac{\mathrm{d}}{\mathrm{d}x}\left(2\cdot\ln\left(x\right)\right)$$

We can use the *product rule* to rewrite our expression as:

$$\left(x^2\right)\cdot\left(\left(\frac{\mathrm{d}}{\mathrm{d}x}\left(2\right)\cdot\ln\left(x\right)\right)+\left(2\cdot\frac{\mathrm{d}}{\mathrm{d}x}\left(\ln\left(x\right)\right)\right)\right)$$

We can use the *ln rule* to rewrite our expression as:

$$\left(x^2\right)\cdot\left(\left(\frac{\mathrm{d}}{\mathrm{d}x}\left(2\right)\cdot\ln\left(x\right)\right)+\left(2\cdot\left(\left(\frac{1}{x}\right)\cdot\frac{\mathrm{d}}{\mathrm{d}x}\left(x\right)\right)\right)\right)$$

We can use the *division to multiplication rule* to rewrite our expression as:

$$\left(x^2\right)\cdot\left(\left(\frac{\mathrm{d}}{\mathrm{d}x}\left(2\right)\cdot\ln\left(x\right)\right)+\left(2\cdot\left(\left(1\cdot\left(x^{(-1\cdot1)}\right)\right)\cdot\frac{\mathrm{d}}{\mathrm{d}x}\left(x\right)\right)\right)\right)$$

We can use the *d/dx(x) = 1 or d/dx(constant) = 0 rule* to rewrite our expression as:

$$\left(x^2\right)\cdot\left(\left(0\cdot\ln\left(x\right)\right)+\left(2\cdot1\cdot\left(x^{(-1\cdot1)}\right)\cdot1\right)\right)$$

We can use the *constant math simplification rule* to rewrite our expression as:

$$\left(x^2\right)\cdot\left(\left(x^{-1}\right)\cdot2\right)$$

We can use the *combine like multiplication terms rule* to rewrite our expression as:

$$2\cdot\left(x^{(2+-1)}\right)$$

We can use the *combine like addition terms rule* to rewrite our expression as:

$$2 \cdot \left(x^{(((-1+2)))} \right)$$

We can use the *constant math simplification rule* to rewrite our expression as:

$$\left(x^1 \right) \cdot 2$$

We can use the *combine like multiplication terms rule* to rewrite our expression as:

$$2 \cdot x$$

This is our final answer.