# Calculus

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## 1 Calculation

We will attempt to simplify the following expression:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$x^2 \cdot x^{-1} \cdot 2$$

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

$$x^2 \cdot x^{-1} \cdot 2$$

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

$$2 \cdot x^{2+-1}$$

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

$$2 \cdot x^{-1+2}$$

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

$$x^1 \cdot 2$$

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

$$x^1 \cdot 2$$

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

$$2 \cdot x$$

This is our final answer.