

**Exercise 33**

Find the derivative of the function.

$$G(x) = 4^{C/x}$$

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**Solution**

Rewrite the function first.

$$G(x) = e^{\ln 4^{C/x}} = e^{\frac{C}{x} \ln 4}$$

Then take the derivative using the chain rule.

$$\begin{aligned} G'(x) &= \frac{dG}{dx} = \frac{d}{dx} \left( e^{\frac{C}{x} \ln 4} \right) \\ &= e^{\frac{C}{x} \ln 4} \cdot \frac{d}{dx} \left( \frac{C}{x} \ln 4 \right) \\ &= e^{\frac{C}{x} \ln 4} \cdot \left( -\frac{C}{x^2} \ln 4 \right) \\ &= -\frac{C \ln 4}{x^2} e^{\frac{C}{x} \ln 4} \end{aligned}$$