Answer on Question# 39985 - Math - Differential Calculus | Equations

Find the derivative of $f(x) = \ln x - e^{3x}$ and $f(x) = \ln x - (x^2 - 4)$

Solution:

$f(x) = \ln x - e^{3x}$

Using: The sum rule:

$(g \pm h)' = g' \pm h'$,

The chain rule:

If $(x) = f(h(x))$, then $\frac{dg}{dx} = \frac{dg}{dh} \cdot \frac{dh}{dx}$

Constant division rule: $\big(ag(x)\big)' = ag'(x)$

Power rule: $(x^n)' = nx^{n-1}$

As we know: $(\ln \mathrm{x})' = \frac{1}{x}$, $(e^x)' = e^x$.

Therefore, we obtain

$f'(x) = (\ln \mathrm{x})' - e^{3x} \cdot (3x)' = \frac{1}{x} - 3e^{3x}$.

Answer:

$$\boldsymbol{f'(x) = \frac{1}{x} - 3e^{3x}}$$

$f(x) = \ln x - (x^2 - 4)$

Using: The sum rule: $(g \pm h)' = g' \pm h'$

$$(\ln \mathrm{x})' = \frac{1}{x}$$

Power rule: $(x^n)' = nx^{n-1}$

Constant rule: $(Const)' = 0$

Therefore, we obtain

$$f'(x) = (\ln \mathrm{x})' - \big(x^2\big)' + (4)' = \frac{1}{x} - 2x$$

Answer: $\boldsymbol{f'(x) = \frac{1}{x} - 2x}$