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$d(\ln(1/(\sigma\sqrt{2\pi}))(e^{-(x1-\mu)^2/(2\sigma^2)}))/d\sigma$



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 Examples

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Derivative:

Decimal form

☒ Step-by-step solution

$$\frac{\partial}{\partial \sigma} \left(\log \left(\frac{e^{-(x1-\mu)^2/(2\sigma^2)}}{\sigma \sqrt{2\pi}} \right) \right) = \frac{\mu^2 - \sigma^2 + x1^2 - 2\mu x1}{\sigma^3}$$

$\log(x)$ is the natural logarithm

Solutions:

☒ Step-by-step solution

$$x1 = \frac{1}{2} \sigma^3 \left(\frac{2\mu}{\sigma^3} \pm \sqrt{\frac{4\mu^2}{\sigma^6} - \frac{4\left(\frac{\mu^2}{\sigma^3} - \frac{1}{\sigma}\right)}{\sigma^3}} \right) \left(\frac{1}{\sigma} \neq 0 \right)$$

Alternate forms:

More

$$-\frac{(-\mu + \sigma + x1)(\mu + \sigma - x1)}{\sigma^3}$$

$$\frac{(x1 - \mu)^2 - \sigma^2}{\sigma^3}$$

$$\frac{\mu^2 - \sigma^2 + x1(x1 - 2\mu)}{\sigma^3}$$


Expanded form:


$$\frac{\mu^2}{\sigma^3} - \frac{1}{\sigma} + \frac{x1^2}{\sigma^3} - \frac{2\mu x1}{\sigma^3}$$

Property as a function:

Parity

odd





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Indefinite integral:

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$$\int \frac{x^2 - 2x\mu + \mu^2 - \sigma^2}{\sigma^3} dx = \frac{\frac{x^3}{3} - \mu x^2 + \mu^2 x - \sigma^2 x}{\sigma^3} + \text{constant}$$

Limit:

$$\lim_{\sigma \rightarrow \pm\infty} \frac{x^2 - 2x\mu + \mu^2 - \sigma^2}{\sigma^3} = 0$$

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- = series $(f(x+\epsilon)/f(x))...$
- = Felix Hausdorff

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