Normalni :

```
ClearAll[α, σ, μ, x]

p = 1 / Sqrt[2 * π * σ ^ 2] * Exp[-(x - μ) ^ 2 / (2 * σ ^ 2)]
```

$$\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{2\pi}\ \sqrt{\sigma^2}}$$

```
θ = σ;

ss = FullSimplify[D[Log[p], θ]]
```

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

```
ss' = FullSimplify[D[ss, θ]]
```

$$\frac{-3(x-\mu)^2 + \sigma^2}{\sigma^4}$$

```
csIntCitatel1 = FullSimplify[p ^ (1 + α) * ss]
```

$$\frac{(2\pi)^{\frac{1}{2}(-1-\alpha)} \left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha} \left((x-\mu)^2 - \sigma^2\right)}{\sigma^3}$$

```
csIntCitatel2 = FullSimplify[csIntCitatel1 /. (x - μ) → y * σ]
```

$$\frac{(2\pi)^{\frac{1}{2}(-1-\alpha)} \left(-1 + y^2\right) \left(\frac{e^{-\frac{y^2}{2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}}{\sigma}$$

```
csIntCitatel3 = FullSimplify[Integrate[csIntCitatel2 * σ, {y, -∞, ∞}]]
```

$$\text{ConditionalExpression}\left[-\frac{(2\pi)^{-\alpha/2}\ \alpha\ \left(\sigma^2\right)^{-\frac{1}{2}-\frac{\alpha}{2}}}{(1+\alpha)^{3/2}},\ \text{Re}[\alpha] > -1\right]$$

```
csIntJmenovatel1 = FullSimplify[p ^ (1 + α)]
```

$$(2\pi)^{\frac{1}{2}(-1-\alpha)} \left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}$$

```
csIntJmenovatel2 = FullSimplify[csIntJmenovatel1 /. (x - μ) → y * σ]
```

$$(2\pi)^{\frac{1}{2}(-1-\alpha)} \left(\frac{e^{-\frac{y^2}{2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}$$

```
csIntJmenovatel3 = FullSimplify[Integrate[csIntJmenovatel2 * σ, {y, -∞, ∞}]]
```

$$\text{ConditionalExpression}\left[\frac{(2\pi)^{-\alpha/2}\ \sigma\ \left(\sigma^2\right)^{-\frac{1}{2}-\frac{\alpha}{2}}}{\sqrt{1+\alpha}},\ \text{Re}[\alpha] > -1\right]$$

```
cs = FullSimplify[csIntCitatel3 / csIntJmenovatel3]
```

$$\text{ConditionalExpression}\left[-\frac{\alpha}{\sigma + \alpha\,\sigma},\ \text{Re}[\alpha] > -1\right]$$

```
cs' = FullSimplify[D[cs, θ]]
```

$$\text{ConditionalExpression}\left[\frac{\alpha}{(1+\alpha)\,\sigma^2},\ \text{Re}[\alpha] > -1\right]$$

```
Ia = FullSimplify[ (ss' - cs' - α (ss - cs) (cs - ss)) * p^(1 + α)]
```

$$\text{ConditionalExpression}\left[\frac{(2\,\pi)^{\frac{1}{2}(-1-\alpha)}\left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}\left(\alpha\,(x-\mu)^4 - \frac{(3+5\,\alpha)\,(x-\mu)^2\,\sigma^2}{1+\alpha} + \frac{(1+2\,\alpha)\,\sigma^4}{(1+\alpha)^2}\right)}{\sigma^6},\ \text{Re}[\alpha] > -1\right]$$

```
Ia1 = FullSimplify[Ia /. (x - μ) → y * σ]
```

$$\text{ConditionalExpression}\left[\frac{(2\,\pi)^{\frac{1}{2}(-1-\alpha)}\left(1 + 2\,\alpha + y^2\,(1+\alpha)\left(-3 + \alpha\left(-5 + y^2\,(1+\alpha)\right)\right)\right)\left(\frac{e^{-\frac{y^2}{2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}}{(1+\alpha)^2\,\sigma^2},\ \text{Re}[\alpha] > -1\right]$$

```
Ia2 = FullSimplify[Integrate[Ia1 * σ, {y, -∞, ∞}]]
```

$$\text{ConditionalExpression}\left[-\frac{2^{1-\frac{\alpha}{2}}\,\pi^{-\alpha/2}\left(\sigma^2\right)^{\frac{1}{2}-\frac{\alpha}{2}}}{(1+\alpha)^{5/2}\,\sigma^3},\ \text{Re}[\alpha] > -1\right]$$

```
IF = FullSimplify[-Ia2^(-1) * (p^α) * (ss - cs)]
```

$$\text{ConditionalExpression}\left[\frac{1}{2}\,(1+\alpha)^{3/2}\left(\sigma^2\right)^{\frac{1}{2}(-1+\alpha)}\left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{\alpha}\left((1+\alpha)\,(x-\mu)^2 - \sigma^2\right),\ \text{Re}[\alpha] > -1\right]$$

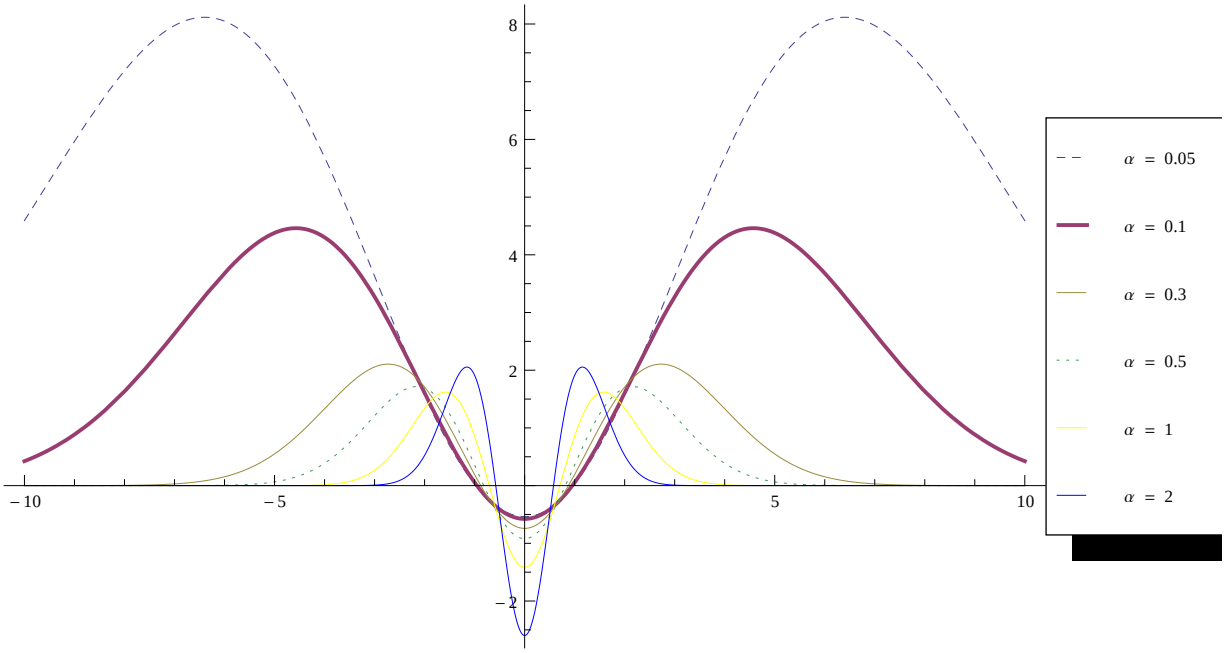
```
IF1 = FullSimplify[IF /. μ -> 0]
```

$$\text{ConditionalExpression}\left[\frac{1}{2}\,(1+\alpha)^{3/2}\left(\sigma^2\right)^{\frac{1}{2}(-1+\alpha)}\left(\frac{e^{-\frac{x^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{\alpha}\left(x^2\,(1+\alpha) - \sigma^2\right),\ \text{Re}[\alpha] > -1\right]$$

```
IFun = Function[{σ, α}, 1/2 (1 + α)^(3/2) (σ^2)^(1/2 (-1 + α)) (e^(-x^2/(2 σ^2))/Sqrt[σ^2])^α (x^2 (1 + α) - σ^2)];
```

```
Needs["PlotLegends`"]
```

```
Plot[{
  IFun[1, 0.05],
  IFun[1, 0.1],
  IFun[1, 0.3],
  IFun[1, 0.5],
  IFun[1, 1],
  IFun[1, 2]},
 {x, -10, 10},
 PlotLegend → {"α = 0.05", "α = 0.1", "α = 0.3", "α = 0.5", "α = 1", "α = 2"},
 LegendPosition → {1, -0.4},
 PlotStyle → {Dashed, Thick, Thin, Dotted, Yellow, Blue}
]
```



Normalni :

```
ClearAll[α, σ, μ, x]
```

```
p = 1 / Sqrt[2 * π * σ ^ 2] * Exp[-(x - μ) ^ 2 / (2 * σ ^ 2)]
```

$$\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{2\pi}\ \sqrt{\sigma^2}}$$

```
θ = μ
```

μ

```
ss = FullSimplify[D[Log[p], θ]]
```

$$\frac{x-\mu}{\sigma^2}$$

```
ss' = FullSimplify[D[ss, θ]]
```

$$-\frac{1}{\sigma^2}$$

```
csIntCitatel1 = FullSimplify[p^(1 + α) * ss]
```

$$\frac{(2\pi)^{\frac{1}{2}(-1-\alpha)}\ (x-\mu)\left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}}{\sigma^2}$$

```
csIntCitatel2 = FullSimplify[csIntCitatel1 /. (x - μ) → y * σ]
```

$$\frac{(2\pi)^{\frac{1}{2}(-1-\alpha)}\ y\left(\frac{e^{-\frac{y^2}{2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}}{\sigma}$$

```
csIntCitatel3 = FullSimplify[Integrate[csIntCitatel2 * σ, {y, -∞, ∞}]]
```

ConditionalExpression[0, Re[α] > -1]

```
csIntJmenovatel1 = FullSimplify[p^(1 + α)]
```

$$(2\pi)^{\frac{1}{2}(-1-\alpha)}\left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}$$

```
csIntJmenovatel2 = FullSimplify[csIntJmenovatel1 /. (x - μ) → y * σ]
```

$$(2\pi)^{\frac{1}{2}(-1-\alpha)}\left(\frac{e^{-\frac{y^2}{2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}$$

```
csIntJmenovatel3 = FullSimplify[Integrate[csIntJmenovatel2 * σ, {y, -∞, ∞}]]
```

$$\text{ConditionalExpression}\left[\frac{(2\pi)^{-\alpha/2}\ \sigma\ \left(\sigma^2\right)^{-\frac{1}{2}-\frac{\alpha}{2}}}{\sqrt{1+\alpha}},\ \text{Re}[\alpha] > -1\right]$$

```
cs = FullSimplify[csIntCitatel3 / csIntJmenovatel3]
```

ConditionalExpression[0, Re[α] > -1]

```
cs' = FullSimplify[D[cs, θ]]
```

ConditionalExpression[0, Re[α] > -1]

```
Ia = FullSimplify[(ss' - cs' - α (ss - cs) (cs - ss)) * p^(1 + α)]
```

$$\text{ConditionalExpression}\left[(2\pi)^{\frac{1}{2}(-1-\alpha)}\left(\frac{\alpha\ (x-\mu)^2}{\sigma^4}-\frac{1}{\sigma^2}\right)\left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha},\ \text{Re}[\alpha] > -1\right]$$

```
Ia1 = FullSimplify[Ia /. (x - μ) → y * σ]
```

$$\text{ConditionalExpression}\left[\frac{(2\pi)^{\frac{1}{2}(-1-\alpha)}\left(-1+y^2\alpha\right)\left(\frac{e^{-\frac{y^2}{2}}}{\sqrt{\sigma^2}}\right)^{1+\alpha}}{\sigma^2}, \text{Re}[\alpha] > -1\right]$$

```
Ia2 = FullSimplify[Integrate[Ia1 * σ, {y, -∞, ∞}]]
```

$$\text{ConditionalExpression}\left[-\frac{(2\pi)^{-\alpha/2}\left(\sigma^2\right)^{\frac{1}{2}-\frac{\alpha}{2}}}{(1+\alpha)^{3/2}\,\sigma^3}, \text{Re}[\alpha] > -1\right]$$

```
IF = FullSimplify[-Ia2^(-1) * (p^α) * (ss - cs)]
```

$$\text{ConditionalExpression}\left[(1+\alpha)^{3/2}(x-\mu)\,\sigma\left(\sigma^2\right)^{\frac{1}{2}(-1+\alpha)}\left(\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{\sigma^2}}\right)^{\alpha}, \text{Re}[\alpha] > -1\right]$$

```
IF1 = FullSimplify[IF /. σ → 1]
```

$$\text{ConditionalExpression}\left[\left(e^{-\frac{1}{2}(x-\mu)^2}\right)^{\alpha}(1+\alpha)^{3/2}(x-\mu), \text{Re}[\alpha] > -1\right]$$

```
IFun = Function[{μ, α}, (e^(-1/2 (x-μ)^2))^α (1 + α)^(3/2) (x - μ)];

Needs["PlotLegends`"]
```

```
Plot[{
  IFun[0, 0.05],
  IFun[0, 0.1],
  IFun[0, 0.3],
  IFun[0, 0.5],
  IFun[0, 1],
  IFun[0, 2]},
 {x, -10, 10},
 PlotLegend → {"α = 0.05", "α = 0.1", "α = 0.3", "α = 0.5", "α = 1", "α = 2"},
 LegendPosition → {1, -0.4},
 PlotStyle → {Dashed, Thick, Thin, Dotted, Yellow, Blue}
]
```