Exponencialni :

```
ClearAll[α, σ, μ, x];

p = 1 / σ * Exp[-(x - μ) / (σ)]
```

$$\frac{e^{\frac{-x+\mu}{\sigma}}}{\sigma}$$

```
θ = σ;

ss = FullSimplify[D[Log[p], θ]]
```

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

```
ss' = FullSimplify[D[ss, θ]]
```

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

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

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

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

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

```
csIntCitatel3 = FullSimplify[Integrate[csIntCitatel2 * σ, {y, 0, ∞}]]
```

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

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

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

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

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

```
csIntJmenovatel3 = FullSimplify[Integrate[csIntJmenovatel2 * σ, {y, 0, ∞}]]
```

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

```
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)]
```

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

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

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

```
Ia2 = FullSimplify[Ia1 /. (x - μ) → y * σ]
```

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

```
Ia3 = FullSimplify[Integrate[Ia2 * σ, {y, 0, ∞}]]
```

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

```
IF = FullSimplify[-Ia3^(-1) * (p^α) * (ss - cs)]
```

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

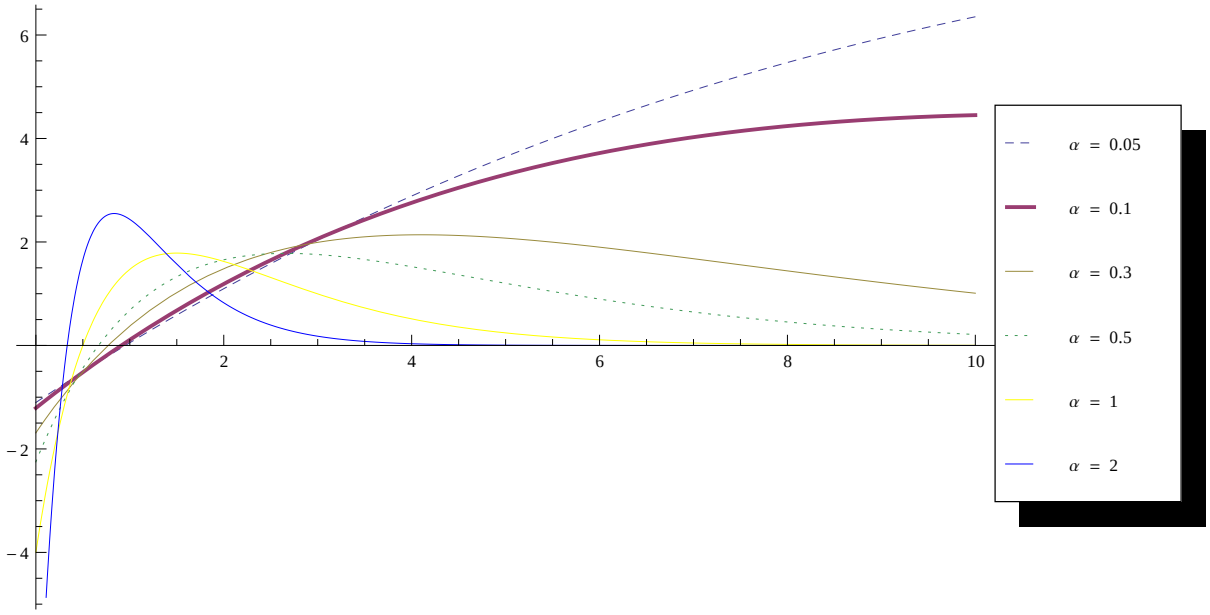
```
IF1 = FullSimplify[IF /. μ -> 0]
```

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

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

```
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, 0, 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}
]
```



Exponencialni :

```
ClearAll[α, σ, μ, x];
θ = μ;
ss = FullSimplify[D[Log[p], θ]]
```

$$\frac{1}{\sigma}$$

```
ss' = FullSimplify[D[ss, θ]]
```

```
0
```

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

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

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

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

```
csIntCitatel3 = FullSimplify[Integrate[csIntCitatel2 * σ, {y, 0, ∞}]]
```

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

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

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

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

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

```
csIntJmenovatel3 = FullSimplify[Integrate[csIntJmenovatel2 * σ, {y, 0, ∞}]]
```

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

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

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

```
cs' = FullSimplify[D[cs, θ]]
```

$$\text{ConditionalExpression}[0, \text{Re}[\alpha] > -1]$$

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

$$\text{ConditionalExpression}[0, \text{Re}[\alpha] > -1]$$

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

$$\text{ConditionalExpression}[0, \text{Re}[\alpha] > -1]$$

```
Ia2 = FullSimplify[Integrate[Ia1 * σ, {y, 0, ∞}]]
```

$$\text{ConditionalExpression}[0, \text{Re}[\alpha] > -1]$$

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

Power::infy: Infinite expression $\frac{1}{0}$ encountered. ≫

Infinity::indet: Indeterminate expression $0\left(\frac{e^{\frac{-x+\mu}{\sigma}}}{\sigma}\right)^{\alpha}$ ComplexInfinity encountered. ≫

$$\text{ConditionalExpression}[\text{Indeterminate}, \text{Re}[\alpha] > -1]$$

```
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, 0, 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}
]
```