```
> with(LinearAlgebra) :
  with(VectorCalculus) :
  with(Student[LinearAlgebra]) :
   with(SignalProcessing) :
  with(Statistics) :
  with(stats) :
  with(IntegrationTools) :
  infolevel[IntegrationTools] :
  with(LinearAlgebra) :
  with(Student[Statistics]) :
> N_x := 30 : N_y := 30 :
> n_x := 24 : n_y := 24 :
>
> λλ[1] := 6 : λλ[2] := 5 : αα := 30 :  υυ := 8 :
> τ_x[1] := Determinant(Sample(DiscreteUniformRandomVariable(0, N_x − n_x), 1)) :
  for i from 2 to n_x do
```

$$\tau\_x[i] := Determinant\left(Sample\left(DiscreteUniformRandomVariable\left(0, N\_x - n\_x - \sum_{k=1}^{i-1} \tau\_x[k]\right), 1\right)\right) :$$

```
  end do:
  R_x := [seq(τ_x[nl], nl = 1 ..n_x)];
  τ_y[1] := Determinant(Sample(DiscreteUniformRandomVariable(0, N_y − n_y), 1)) :
  for i from 2 to n_y do
```

$$\tau\_y[i] := Determinant\left(Sample\left(DiscreteUniformRandomVariable\left(0, N\_y - n\_y - \sum_{k=1}^{i-1} \tau\_y[k]\right), 1\right)\right) :$$

```
  end do:
  R_y := [seq(τ_y[nl], nl = 1 ..n_y)]; W := GenerateUniform(n_x, 0, 1) : for  iii from 1
      to n_x do
```

$$vv[iii] := W[iii]^{\frac{1}{iii + \sum_{jjj=1}^{iii} R\_x[n\_x - jjj + 1]}} :$$

```
  end do: for sss from 1 to n_x do
```

$$uu[sss] := 1 - \prod_{jjj=1}^{sss} vv[n\_x - jjj + 1]:$$

$$x[sss] := fsolve\left(1 - \frac{\alpha\alpha \cdot \exp\left(-\lambda\lambda[1] \cdot t^{\upsilon\upsilon}\right)}{1 - (1 - \alpha\alpha) \cdot \exp\left(-\lambda\lambda[1] \cdot t^{\upsilon\upsilon}\right)} = uu[sss], t = 0..infinity\right):$$

end do : $w := GenerateUniform(n\_y, 0, 1)$:
for ff **from** 1 **to** n_y **do**

$$vo[ff] := w[ff]^{\frac{1}{ff + \sum_{F=1}^{ff} R\_y[n\_y - F + 1]}} :$$

end do:
for ss **from** 1 **to** n_y **do**

$$O[ss] := 1 - \prod_{F=1}^{ss} vo[n\_y - F + 1]:$$

$$y[ss] := fsolve\left(1 - \frac{\alpha\alpha \cdot \exp\left(-\lambda\lambda[2] \cdot t^{\upsilon\upsilon}\right)}{1 - (1 - \alpha\alpha) \cdot \exp\left(-\lambda\lambda[2] \cdot t^{\upsilon\upsilon}\right)} = O[ss], t = 0..infinity\right):$$

end do :

R_x := [5, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
R_y := [4, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0] **(1.1)**

\> $H[1] := describe_{quartile_1}([seq(x[i], i = 1..n\_x)]);$

$H[2] := describe_{quartile_2}([seq(x[i], i = 1..n\_x)]);$

$H[3] := describe_{quartile_3}([seq(x[i], i = 1..n\_x)]);$

$\eta[1] := describe_{quartile_1}([seq(y[i], i = 1..n\_y)]);$

$\eta[2] := describe_{quartile_2}([seq(y[i], i = 1..n\_y)]);$

$\eta[3] := describe_{quartile_3}([seq(y[i], i = 1..n\_y)]);$

$H_1 := 0.8919374313$

$H_2 := 0.9282353678$

$H_3 := 0.9648029321$

$\eta_1 := 0.8936760171$

$\eta_2 := 0.9530509723$

$\eta_3 := 0.9945568573$ **(1.2)**

\>

i want to *solve the following equation* :

\> $fsolve\left(\left\{\left(\left(H[1]^{\upsilon} \cdot \ln(1 + \alpha)\right) - \left(H[2]^{\upsilon} \cdot \ln\left(\frac{3 + \alpha}{3}\right)\right)\right), \left(\left(H[1]^{\upsilon} \cdot \ln(1 + 3 \cdot \alpha)\right)\right.\right.$

$$- \left(H[3]^{\upsilon} \cdot \ln\left(\frac{3+\alpha}{3}\right)\right)\Big)\Big\}, \{\alpha = 0.1 \,..infinity, \upsilon = 0.1 \,..infinity\}\Big)$$

$$fsolve\left(\left\{0.8919374313^{\upsilon} \ln(1+\alpha) - 0.9282353678^{\upsilon} \ln\left(1+\frac{1}{3}\,\alpha\right), 0.8919374313^{\upsilon} \ln(1 + 3\,\alpha) - 0.9648029321^{\upsilon} \ln\left(1+\frac{1}{3}\,\alpha\right)\right\}, \{\alpha, \upsilon\}, \{\alpha = 0.1 \,..\, \infty, \upsilon = 0.1 \,..\, \infty\}\right) \quad \textbf{(1)}$$

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