Elegir datos aleatoriamente a partir de una distribución

In[ ]:= **RandomReal[]**
real aleatorio

Out[ ]= 0.608443

In[ ]:= **SeedRandom[12]**
semilla aleatoria

Out[ ]= RandomGeneratorState[Method: ExtendedCA
State hash: 6 360 736 267 371 515 714]

In[ ]:= **xx8 = AbsoluteTime[]**
tiempo desde 1900

Out[ ]= $3.939698185980355 \times 10^9$

In[ ]:= **IntegerPart@AbsoluteTime[]**
parte entera tiempo desde 1900

Out[ ]= 3 939 698 201

In[ ]:= **IntegerPart@xx8**
parte entera

Out[ ]= 3 939 698 185

In[ ]:= **SeedRandom[IntegerPart@AbsoluteTime[]]**
semilla aleato· parte entera tiempo desde 1900

Out[ ]= RandomGeneratorState[Method: ExtendedCA
State hash: 3 453 120 590 566 154 413]

In[ ]:= **?*Distribution**

System`

ArcSinDistribution	LogLogisticDistribution
BarabasiAlbertGraphDistribution	LogMultinormalDistribution
BatesDistribution	LogNormalDistribution
BeckmannDistribution	LogSeriesDistribution
BenfordDistribution	MarchenkoPasturDistribution
BeniniDistribution	MarginalDistribution
BenktanderGibratDistribution	MatrixNormalDistribution
BenktanderWeibullDistribution	MatrixPropertyDistribution
BernoulliDistribution	MatrixTDistribution
BernoulliGraphDistribution	MaxStableDistribution
BetaBinomialDistribution	MaxwellDistribution
BetaDistribution	MeixnerDistribution

Out[•]=

BetaNegativeBinomialDistribution
BetaPrimeDistribution
BinomialDistribution
BinormalDistribution
BirnbaumSaundersDistribution
BorelTannerDistribution
CategoricalDistribution
CauchyDistribution
CensoredDistribution
ChiDistribution
ChiSquareDistribution
CircularOrthogonalMatrixDistribution
CircularQuaternionMatrixDistribution
CircularRealMatrixDistribution
CircularSymplecticMatrixDistribution
CircularUnitaryMatrixDistribution
CompoundPoissonDistribution
CopulaDistribution
CoxianDistribution
DagumDistribution
DataDistribution
DateDistribution
DavisDistribution
DegreeGraphDistribution
DirichletDistribution
DiscreteUniformDistribution
EmpiricalDistribution
ErlangDistribution
EstimatedDistribution
ExpGammaDistribution
ExponentialDistribution
ExponentialPowerDistribution
ExtremeValueDistribution
FailureDistribution
FindDistribution
FirstPassageTimeDistribution
FisherHypergeometricDistribution
FisherZDistribution
FRatioDistribution
FrechetDistribution
MinStableDistribution
MixtureDistribution
MoyalDistribution
MultinomialDistribution
MultinormalDistribution
MultivariateHypergeometricDistribution
MultivariatePoissonDistribution
MultivariateTDistribution
NakagamiDistribution
NegativeBinomialDistribution
NegativeMultinomialDistribution
NoncentralBetaDistribution
NoncentralChiSquareDistribution
NoncentralFRatioDistribution
NoncentralStudentTDistribution
NormalDistribution
OrderDistribution
ParameterMixtureDistribution
ParetoDistribution
ParetoPickandsDistribution
PascalDistribution
PearsonDistribution
PERTDistribution
PointCountDistribution
PoissonConsulDistribution
PoissonDistribution
PolyaAeppliDistribution
PowerDistribution
PriceGraphDistribution
ProbabilityDistribution
ProductDistribution
QuantityDistribution
RayleighDistribution
ReliabilityDistribution
RiceDistribution
SechDistribution
ShiftedGompertzDistribution
SinghMaddalaDistribution
SkellamDistribution
SkewNormalDistribution

GammaDistribution
GaussianOrthogonalMatrixDistribution
GaussianSymplecticMatrixDistribution
GaussianUnitaryMatrixDistribution
GeometricDistribution
GompertzMakehamDistribution
GraphPropertyDistribution
GumbelDistribution
HalfNormalDistribution
HistogramDistribution
HjorthDistribution
HotellingTSquareDistribution
HoytDistribution
HyperbolicDistribution
HyperexponentialDistribution
HypergeometricDistribution
HypoexponentialDistribution
InverseChiSquareDistribution
InverseGammaDistribution
InverseGaussianDistribution
InverseWishartMatrixDistribution
JohnsonDistribution
KDistribution
KernelMixtureDistribution
KumaraswamyDistribution
LandauDistribution
LaplaceDistribution
LearnDistribution
LearnedDistribution
LevyDistribution
LindleyDistribution
LogGammaDistribution
LogisticDistribution
SliceDistribution
SmoothKernelDistribution
SpatialGraphDistribution
SplicedDistribution
StableDistribution
StandbyDistribution
StationaryDistribution
StudentTDistribution
SurvivalDistribution
SuzukiDistribution
TimeDistribution
TracyWidomDistribution
TransformedDistribution
TriangularDistribution
TruncatedDistribution
TsallisQExponentialDistribution
TsallisQGaussianDistribution
TukeyLambdaDistribution
UniformDistribution
UniformGraphDistribution
UniformSumDistribution
VarianceGammaDistribution
VoigtDistribution
VonMisesDistribution
WakebyDistribution
WalleniusHypergeometricDistribution
WaringYuleDistribution
WattsStrogatzGraphDistribution
WeibullDistribution
WignerSemicircleDistribution
WishartMatrixDistribution
ZipfDistribution

In[ ]:= **xx9 = %**

▾ System`

ArcSinDistribution
BarabasiAlbertGraphDistribution
LogLogisticDistribution
LogMultinormalDistribution

BatesDistribution
BeckmannDistribution
BenfordDistribution
BeniniDistribution
BenktanderGibratDistribution
BenktanderWeibullDistribution
BernoulliDistribution
BernoulliGraphDistribution
BetaBinomialDistribution
BetaDistribution
BetaNegativeBinomialDistribution
BetaPrimeDistribution
BinomialDistribution
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BorelTannerDistribution
CategoricalDistribution
CauchyDistribution
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CircularOrthogonalMatrixDistribution
CircularQuaternionMatrixDistribution
CircularRealMatrixDistribution
CircularSymplecticMatrixDistribution
CircularUnitaryMatrixDistribution
CompoundPoissonDistribution
CopulaDistribution
CoxianDistribution
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DateDistribution
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DirichletDistribution
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EmpiricalDistribution
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LogSeriesDistribution
MarchenkoPasturDistribution
MarginalDistribution
MatrixNormalDistribution
MatrixPropertyDistribution
MatrixTDistribution
MaxStableDistribution
MaxwellDistribution
MeixnerDistribution
MinStableDistribution
MixtureDistribution
MoyalDistribution
MultinomialDistribution
MultinormalDistribution
MultivariateHypergeometricDistribution
MultivariatePoissonDistribution
MultivariateTDistribution
NakagamiDistribution
NegativeBinomialDistribution
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NoncentralBetaDistribution
NoncentralChiSquareDistribution
NoncentralFRatioDistribution
NoncentralStudentTDistribution
NormalDistribution
OrderDistribution
ParameterMixtureDistribution
ParetoDistribution
ParetoPickandsDistribution
PascalDistribution
PearsonDistribution
PERTDistribution
PointCountDistribution
PoissonConsulDistribution
PoissonDistribution
PolyaAeppliDistribution
PowerDistribution
PriceGraphDistribution
ProbabilityDistribution

Out[•]=

ExponentialDistribution
ExponentialPowerDistribution
ExtremeValueDistribution
FailureDistribution
FindDistribution
FirstPassageTimeDistribution
FisherHypergeometricDistribution
FisherZDistribution
FRatioDistribution
FrechetDistribution
GammaDistribution
GaussianOrthogonalMatrixDistribution
GaussianSymplecticMatrixDistribution
GaussianUnitaryMatrixDistribution
GeometricDistribution
GompertzMakehamDistribution
GraphPropertyDistribution
GumbelDistribution
HalfNormalDistribution
HistogramDistribution
HjorthDistribution
HotellingTSquareDistribution
HoytDistribution
HyperbolicDistribution
HyperexponentialDistribution
HypergeometricDistribution
HypoexponentialDistribution
InverseChiSquareDistribution
InverseGammaDistribution
InverseGaussianDistribution
InverseWishartMatrixDistribution
JohnsonDistribution
KDistribution
KernelMixtureDistribution
KumaraswamyDistribution
LandauDistribution
LaplaceDistribution
LearnDistribution
LearnedDistribution
LevyDistribution
ProductDistribution
QuantityDistribution
RayleighDistribution
ReliabilityDistribution
RiceDistribution
SechDistribution
ShiftedGompertzDistribution
SinghMaddalaDistribution
SkellamDistribution
SkewNormalDistribution
SliceDistribution
SmoothKernelDistribution
SpatialGraphDistribution
SplicedDistribution
StableDistribution
StandbyDistribution
StationaryDistribution
StudentTDistribution
SurvivalDistribution
SuzukiDistribution
TimeDistribution
TracyWidomDistribution
TransformedDistribution
TriangularDistribution
TruncatedDistribution
TsallisQExponentialDistribution
TsallisQGaussianDistribution
TukeyLambdaDistribution
UniformDistribution
UniformGraphDistribution
UniformSumDistribution
VarianceGammaDistribution
VoigtDistribution
VonMisesDistribution
WakebyDistribution
WalleniusHypergeometricDistribution
WaringYuleDistribution
WattsStrogatzGraphDistribution
WeibullDistribution
WignerSemicircleDistribution

LindleyDistribution
LogGammaDistribution
LogisticDistribution
WishartMatrixDistribution
ZipfDistribution

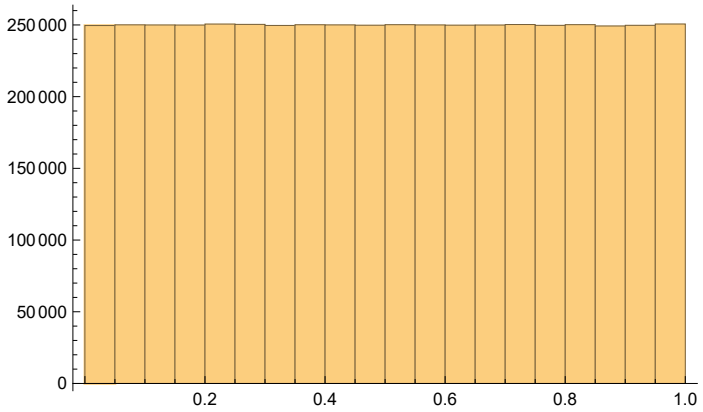
```
In[•]:= Dimensions[xx9]
        dimensiones
Out[•]= {2}

In[•]:= xx9[[1, 1, 2]] // Length
                  longitud
Out[•]= 169

In[•]:= 𝒟u = UniformDistribution[]
          distribución uniforme
Out[•]= UniformDistribution[{0, 1}]

In[•]:= AbsoluteTiming[listaDu = RandomVariate[𝒟u, 5 000 000];]
        duración absoluta          variable aleatoria
Out[•]= {0.028354, Null}

In[•]:= Histogram@listaDu
        histograma
```



Out[•]=

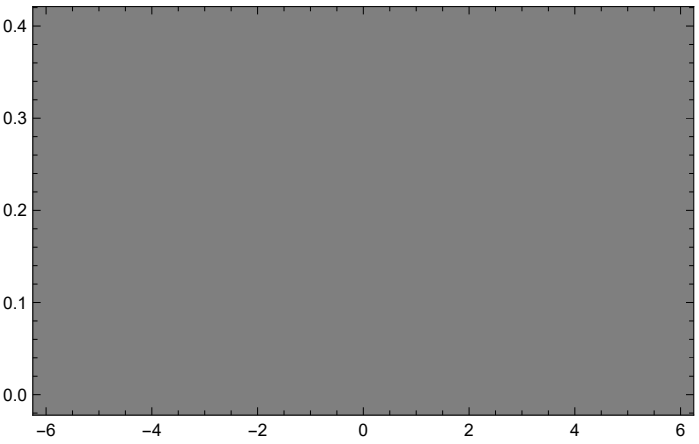
```
In[•]:= 𝒟 = NormalDistribution[]
          distribución normal
Out[•]= NormalDistribution[0, 1]

In[•]:= PDF[𝒟, x]
        función de densidad de probabilidad
```

$$\text{Out}[\bullet]= \frac{e^{-\frac{x^2}{2}}}{\sqrt{2\,\pi}}$$

In[•]:= **grN = Plot[PDF[𝒟, x], {x, -6, 6}, Frame → True, Axes → False, PlotStyle → Magenta]**
repr··· función de densidad de pro··· marco verd··· ejes falso estilo de repr··· magenta

Out[•]=



In[•]:= **x**

Out[•]= x

In[•]:= **x = 5**

Out[•]= 5

In[•]:= **Clear[x]**
borra

In[•]:= **x =.**

In[•]:= **PDF[𝒟, x]**
función de densidad de probabilidad

Out[•]= $\frac{e^{-\frac{x^2}{2}}}{\sqrt{2\,\pi}}$

In[•]:= **Integrate[PDF[𝒟, x], {x, -∞, X}]**
integra función de densidad de probabili

Out[•]= $\frac{1}{2}\left(1 + \text{Erf}\left[\frac{X}{\sqrt{2}}\right]\right)$

In[•]:= **Integrate[PDF[𝒟, x], {x, -∞, ∞}]**
integra función de densidad de probabilic

Out[•]= 1

In[•]:= **CDF[𝒟, x]**
función de distribución acumulada

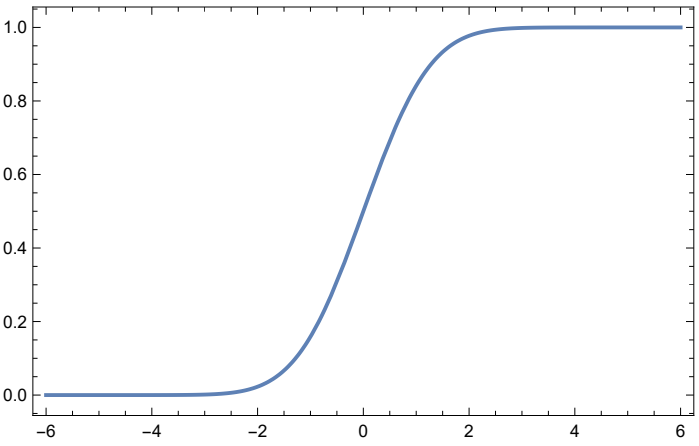
Out[•]= $\frac{1}{2}\,\text{Erfc}\left[-\frac{x}{\sqrt{2}}\right]$

In[•]:=
```
FullSimplify[%52 == %53 /. X → x]
```
simplifica completamente

Out[•]=
```
True
```

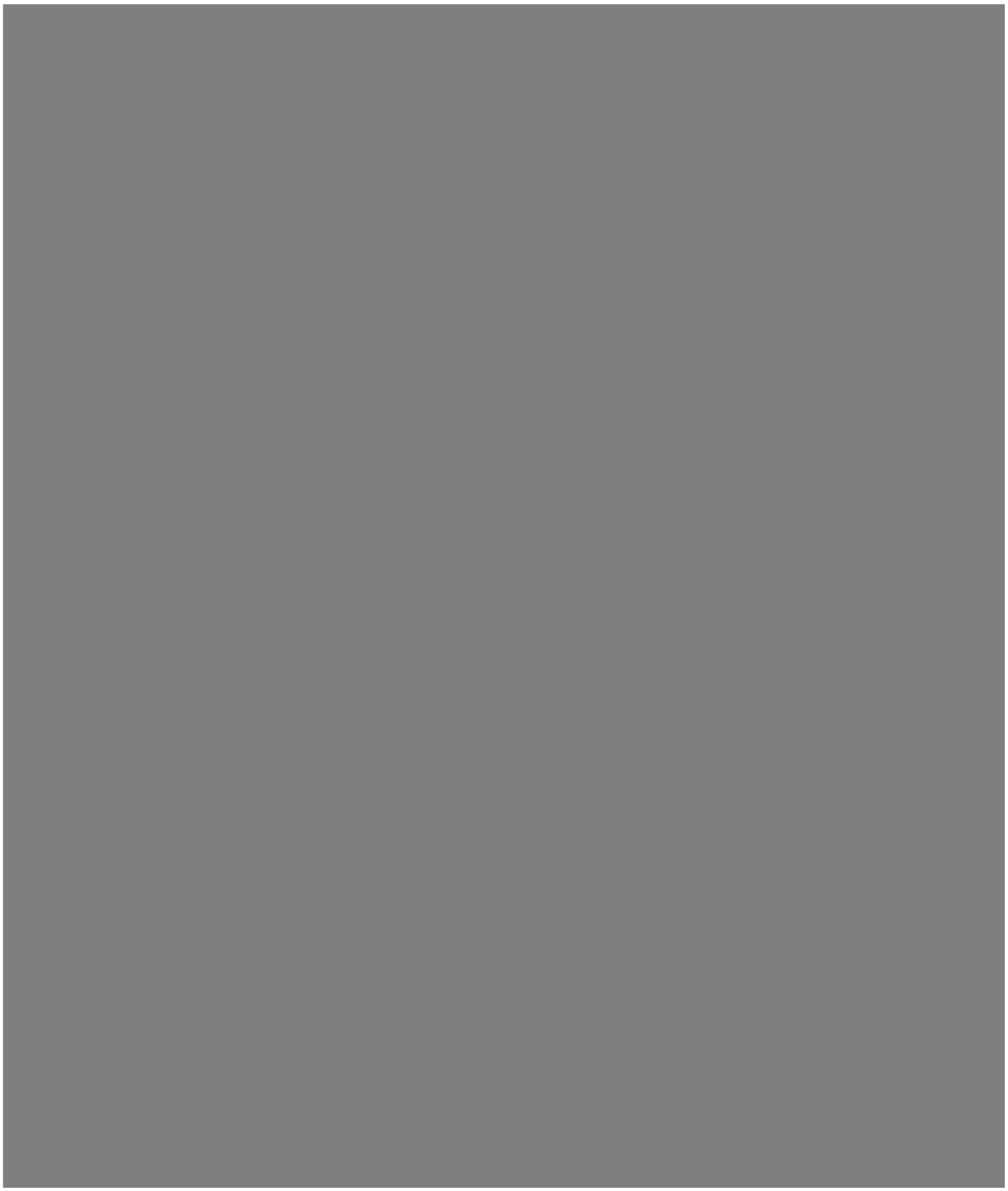
In[•]:=
```
grCN = Plot[CDF[𝒟, x], {x, -6, 6}, Frame → True, Axes → False]
```
repr··· función de distribución acum··· marco verd··· ejes falso

Out[•]=



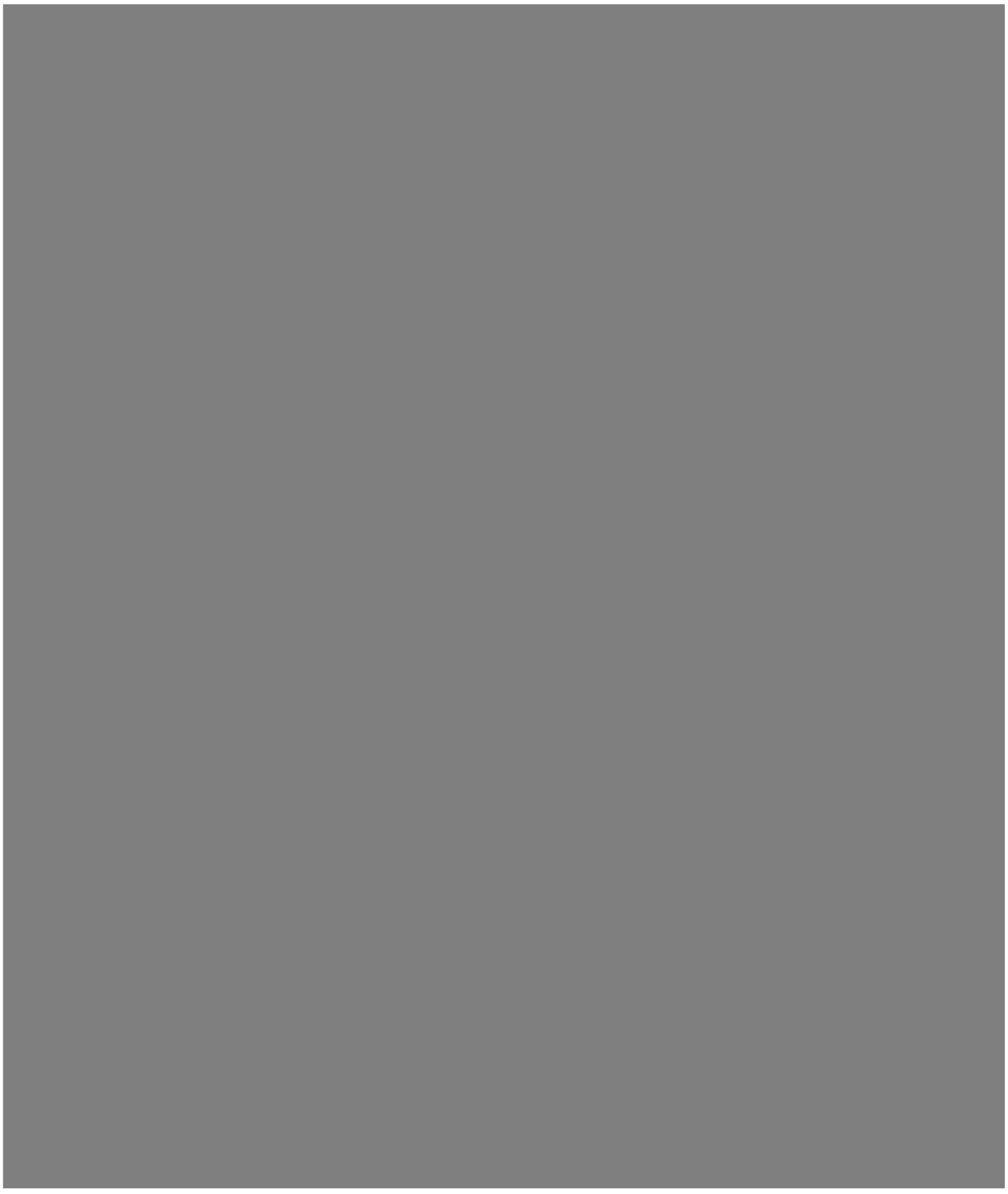
In[ ]:=
```
Manipulate[Show[grN, Plot[PDF[𝒟, x], {x, -6, X}, Filling → Bottom],
 FrameLabel → CDF[𝒟, X]], {X, -5.9, 6}]
```
manipula muestra repr··· función de densidad de pro··· relleno abajo
etiqueta de ma··· función de distribución acumulada

Out[ ]=



In[ ]:=
```
Manipulate[Show[grCN,
 Plot[CDF[𝒟, x], {x, -6, X}, Filling → Bottom], FrameLabel → CDF[𝒟, X]], {X, -4, 6}]
```
manipula muestra repr··· función de distribución acum··· relleno abajo etiqueta de ma··· función de distribución acumulad

Out[ ]=



In[ ]:= `x0 = RandomReal[]`
real aleatorio

Out[ ]= `0.412862`

In[ ]:= `CDF[𝒟, x]`
función de distribución acumulada

Out[ ]= $\frac{1}{2}\,\text{Erfc}\left[-\frac{x}{\sqrt{2}}\right]$

In[ ]:= `Solve[CDF[𝒟, x] == x0, x]`
resue·· función de distribución ac

Solve: Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information.

Out[ ]= `{{x → -0.22019}}`

In[ ]:= `FindRoot[CDF[𝒟, x] == x0, {x, -3}]`
encuentra·· función de distribución acumulada

Out[ ]= `{x → -0.22019}`

In[ ]:=
```
AbsoluteTiming[
  randNormal = ParallelTable[FindRoot[CDF[𝒟, y] == RandomReal[], {y, 0.}][[1, 2]], {400000}];]
```
duración absoluta; tabla en paralelo; encuentra··; función de dist·; real aleatorio

(kernel 1) FindRoot: The line search decreased the step size to within tolerance specified by AccuracyGoal and PrecisionGoal but was unable to find a sufficient decrease in the merit function. You may need more than MachinePrecision digits of working precision to meet these tolerances.

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(kernel 1) FindRoot: The line search decreased the step size to within tolerance specified by AccuracyGoal and PrecisionGoal but was unable to find a sufficient decrease in the merit function. You may need more than MachinePrecision digits of working precision to meet these tolerances.

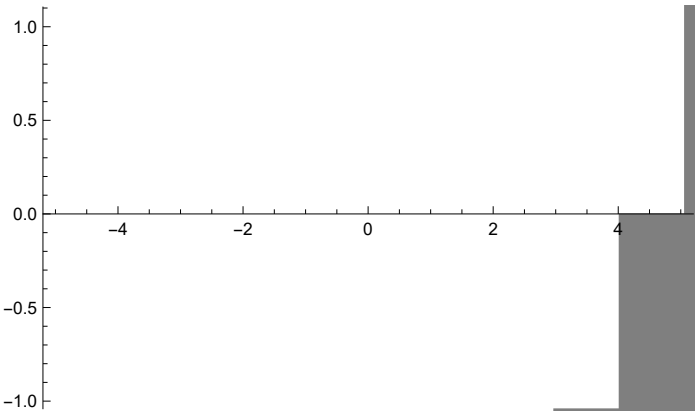
Out[ ]= `{84.3517, Null}`

In[ ]:= `(Length@randNormal) == Length[Select[randNormal, NumberQ]]`
longitud; longitud; selecciona; ¿número?

Out[ ]= `True`

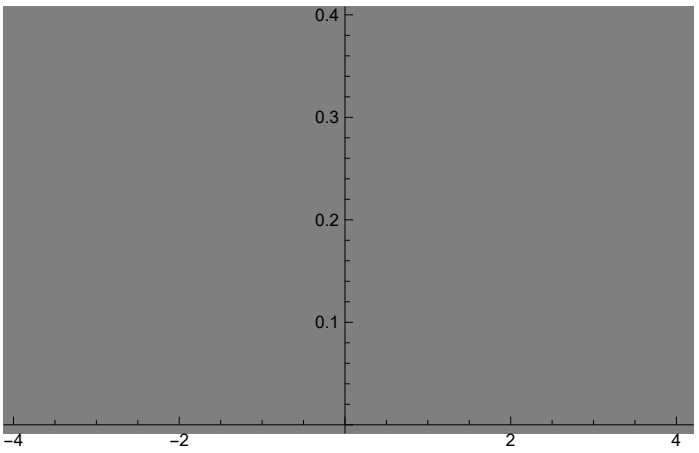
In[ ]:=
```
Histogram@randNormal
```
histograma

Out[ ]=



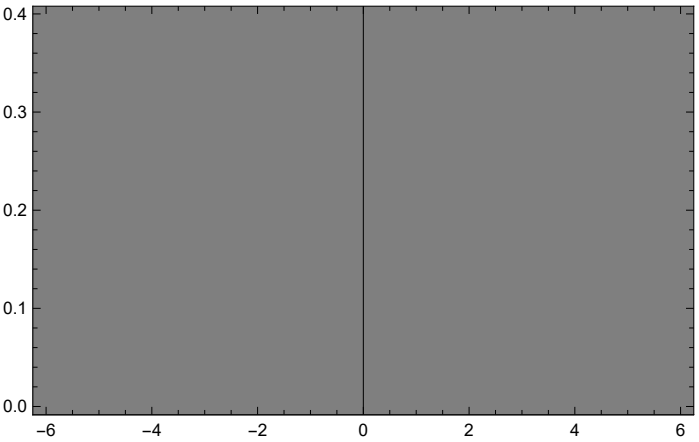
In[ ]:=
```
SmoothHistogram@randNormal
```
histograma suave

Out[ ]=



In[ ]:=
```
Show[SmoothHistogram@randNormal, grN, Frame → True]
```
mue·· histograma suave marco verdade

Out[ ]=



In[ ]:=
```
𝒟
```

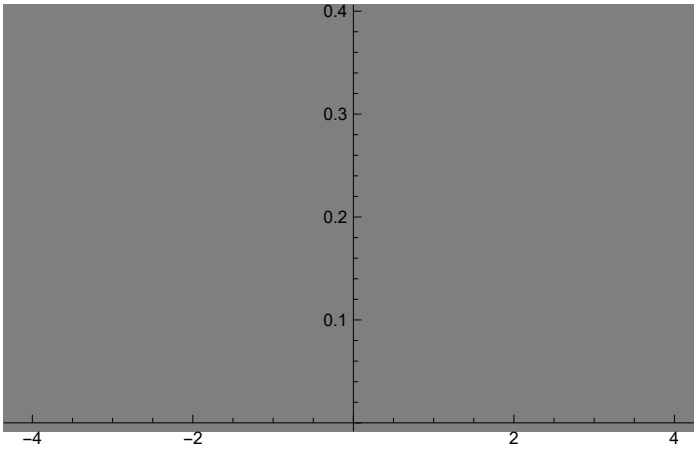
Out[ ]=
```
NormalDistribution[0, 1]
```

In[•]:=
```
AbsoluteTiming[dat = RandomVariate[𝒟, 400 000];]
```
duración absoluta variable aleatoria

Out[•]=
```
{0.008193, Null}
```

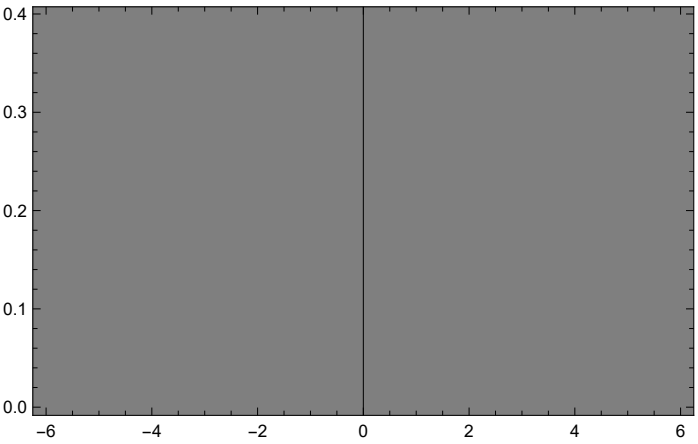
In[•]:=
```
SmoothHistogram@dat
```
histograma suave

Out[•]=



In[•]:=
```
Show[SmoothHistogram@dat, grN, Frame → True]
```
mue·· histograma suave marco verdade

Out[•]=



In[•]:=
```
Manipulate[SmoothHistogram[RandomVariate[NormalDistribution[μ, σ], 100 000]],
 {{μ, .0}, -1., 1., .05}, {{σ, 1.}, 0.05, 5, .05}]
```
manipula histograma suave variable aleatoria distribución normal

In[•]:=
```
PDF[MaxwellDistribution[σ], x]
```
fun·· distribución Maxwell

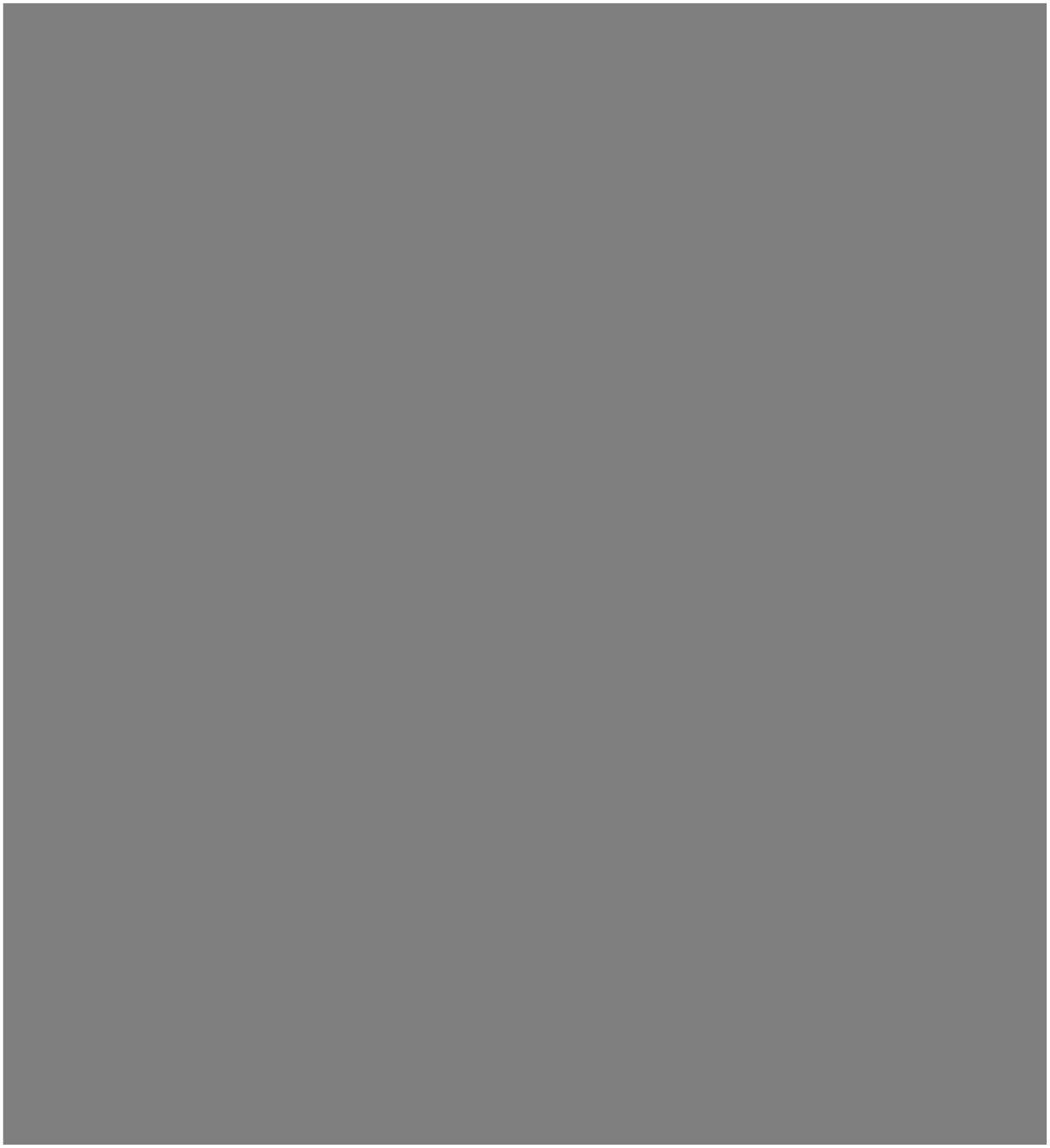
Out[•]=
$$\begin{cases} \frac{e^{-\frac{x^2}{2\sigma^2}}\sqrt{\frac{2}{\pi}}\,x^2}{\sigma^3} & x > 0 \\ 0 & \text{True} \end{cases}$$

In[ ]:=
```
PDF[MaxwellDistribution[σ], x][[1, 1, 1]]
```
fun·· distribución Maxwell

Out[ ]=
$$\frac{e^{-\frac{x^2}{2\sigma^2}}\sqrt{\frac{2}{\pi}}\,x^2}{\sigma^3}$$

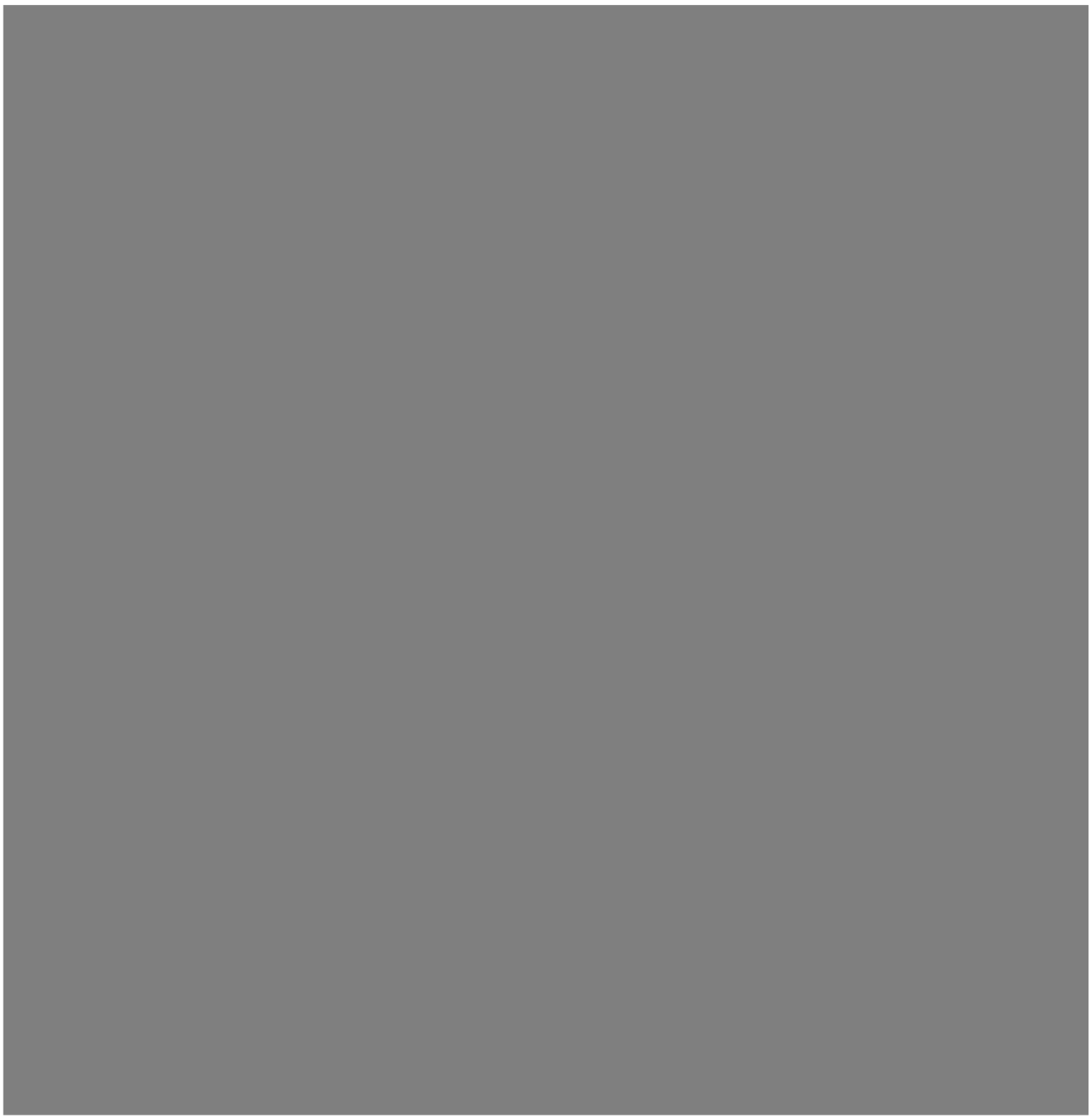
In[ ]:=
```
Manipula[Plot[PDF[MaxwellDistribution[σ], x], {x, 0, 100}, PlotRange → All],
 {{σ, 1.}, .1, 50, .1}]
```
manipula repr··· fun·· distribución Maxwell rango de rep··· todo

Out[ ]=



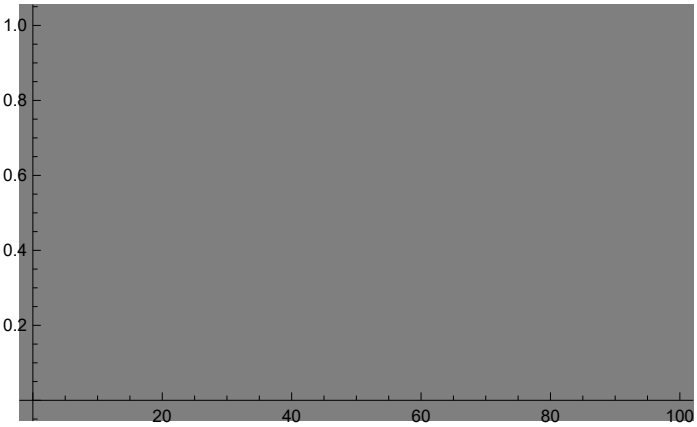
In[ ]:=
```
Manipulate[Plot[CDF[MaxwellDistribution[σ], x], {x, 0, 100}, PlotRange → All],
 {{σ, 20.}, .1, 50, .1}]
```

Out[ ]=



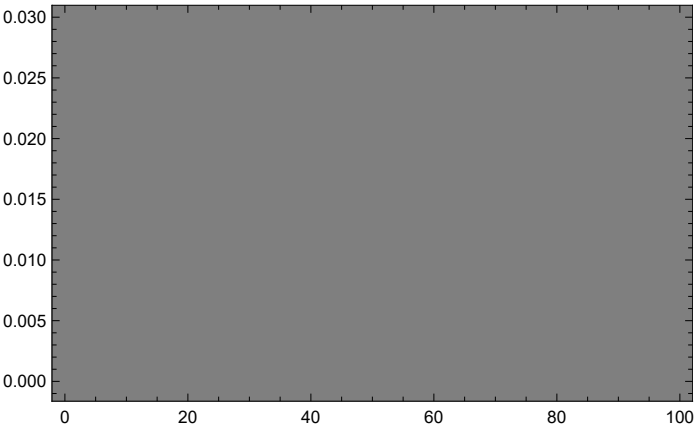
In[•]:=
```
Plot[CDF[MaxwellDistribution[20], x], {x, 0, 100}]
```
repr··· fun·· distribución Maxwell

Out[•]=



In[•]:=
```
max1 = Plot[PDF[MaxwellDistribution[20], x], {x, 0, 100}, PlotStyle → Magenta, Frame → True]
```
repr··· fun·· distribución Maxwell estilo de repr··· magenta marco verdade

Out[•]=



In[•]:=
```
𝒟 = MaxwellDistribution[20]
```
distribución Maxwell

Out[•]=
```
MaxwellDistribution[20]
```

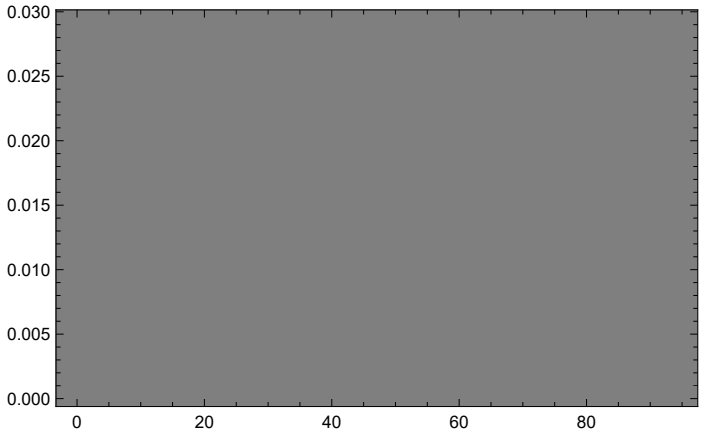
In[•]:=
```
AbsoluteTiming[tabmaxwell = ParallelTable[
    FindRoot[CDF[𝒟, x] == RandomVariate[UniformDistribution[]], {x, 0, 150.}], {10000}];]
```
duración absoluta tabla en paralelo
encuentra·· función de dist· variable aleatoria distribución uniforme

Out[•]=
```
{1.03062, Null}
```

In[•]:=
```
tabmaxwell[[All, 1, 2]];
```
todo

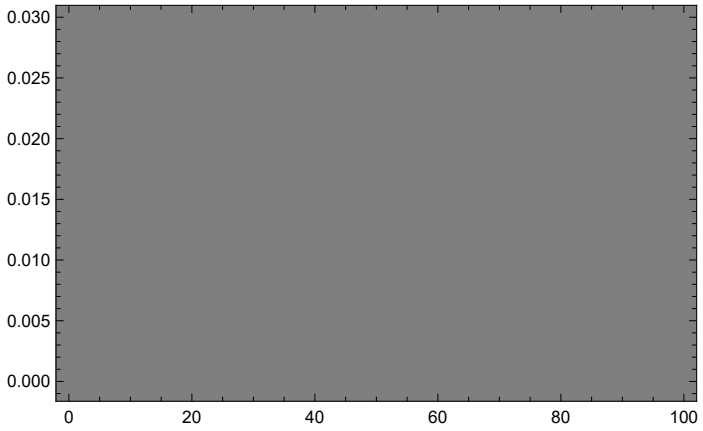
In[•]:=
```
SmoothHistogram[tabmaxwell[[All, 1, 2]], PlotStyle → Cyan, Frame → True]
```
histograma suave | todo | estilo de repr··· | cian | marco | verdade

Out[•]=



In[•]:=
```
Show[max1, SmoothHistogram[RandomVariate[MaxwellDistribution[20], 10000], PlotStyle → Red,
  Frame → True], SmoothHistogram[tabmaxwell[[All, 1, 2]], PlotStyle → Cyan, Frame → True]]
```
muestra | histograma suave | variable aleatoria | distribución Maxwell | estilo de repr··· | rojo
marco | verda··· | histograma suave | todo | estilo de repr··· | cian | marco | verdadero

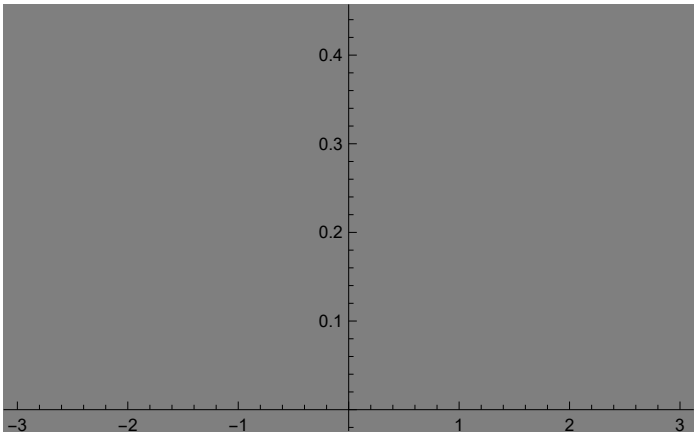
Out[•]=



In[•]:=
```
𝒟 = VonMisesDistribution[0, 1.5];
```
distribución Von Mises

In[ ]:=
```
Show[Plot[PDF[𝒟, x], {x, -3, 3}, PlotStyle → Magenta],
 SmoothHistogram@RandomVariate[𝒟, 1000000]]
```
mue·· repr··· función de densidad de pro··· estilo de repr··· magenta
histograma suave variable aleatoria

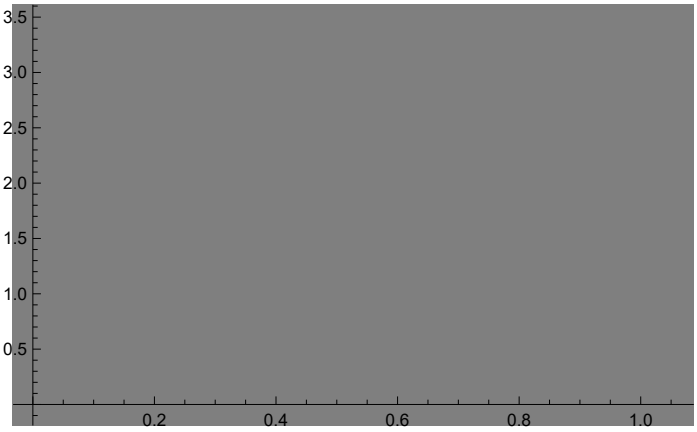
Out[ ]=



In[ ]:=
```
𝒟 = KumaraswamyDistribution[2, 3 / 4];
```
distribución Kumaraswamy

In[ ]:=
```
Show[Plot[PDF[𝒟, x], {x, 0, 1}, PlotStyle → Magenta],
 SmoothHistogram@RandomVariate[𝒟, 1000000], PlotRange → All]
```
mue·· repr··· función de densidad de pr··· estilo de repr··· magenta
histograma suave variable aleatoria rango de rep··· todo

Out[ ]=



In[ ]:=
```
data = RandomVariate[𝒟, 10000000];
```
variable aleatoria

In[ ]:=
```
dist = SmoothKernelDistribution[data, Automatic, {"Bounded", {0, 1}, "Gaussian"}];
```
distribución de núcleo suave automático

In[ ]:=
```
Plot[{PDF[𝒟, x], PDF[dist, x]}, {x, 0, 1}, PlotStyle → {Magenta, Blue}]
```
repre··· función de ··· función de densidad de probabil··· estilo de repre··· magenta azul

Out[ ]=