In[∘]:=
```
f[x_] := x^2
```

In[∘]:=
```
Integrate[f[x], x]
```

Out[∘]= $\frac{x^3}{3}$

In[∘]:=
```
D[f[x], x]
```

Out[∘]= $2\,x$

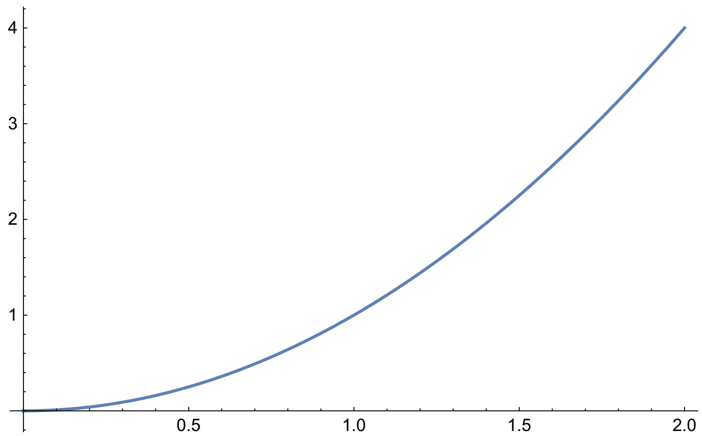
In[∘]:=
```
Integrate[f]
```

... Integrate: Integrate called with 1 argument; 2 or more arguments are expected.

Out[∘]=
```
Integrate[f]
```

In[∘]:=
```
Plot[f[x], {x, 0, 2}]
```

Out[∘]=



In[∘]:=
```
? Exp
```

Exp[z] gives the exponential of z. >>

In[∘]:=
```
? PoissonDistribution
```

PoissonDistribution[μ] represents a Poisson distribution with mean μ. >>

In[∘]:=
```
g[x_] := PoissonDistribution[1][x]
```

In[∘]:=
```
g[1.]
```

Out[∘]=
```
PoissonDistribution[1][1.]
```

In[∘]:=
```
ff = PDF[PoissonDistribution[1]]
```

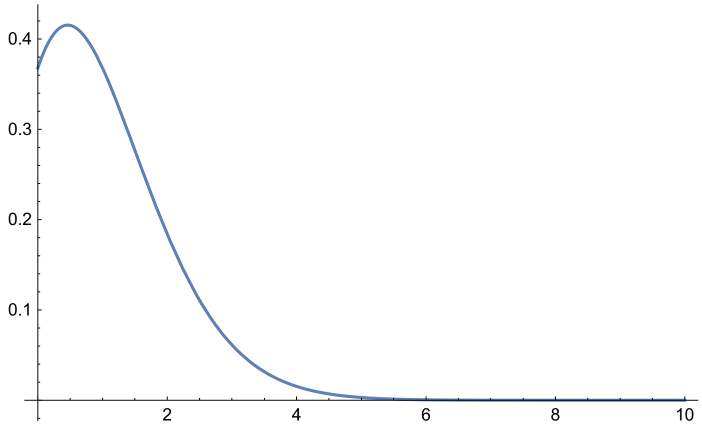
Out[∘]= Function$\left[\dot{x},\ \begin{cases} \frac{1}{e\,\dot{x}!} & \dot{x} \geq 0 \\ 0 & \text{True} \end{cases},\ \text{Listable}\right]$

In[∘]:=
```
ff[1]
```

Out[∘]= $\frac{1}{e}$

In[∘]:= `Plot[ff[x], {x, 0, 10}]`

Out[∘]=



In[∘]:= `Mean[ff]`

Out[∘]= Mean[Function[x, $\begin{cases} \frac{1}{e\, x!} & x \geq 0 \\ 0 & \text{True} \end{cases}$, Listable]]

In[∘]:= `Mean[PoissonDistribution[1]]`

Out[∘]= 1

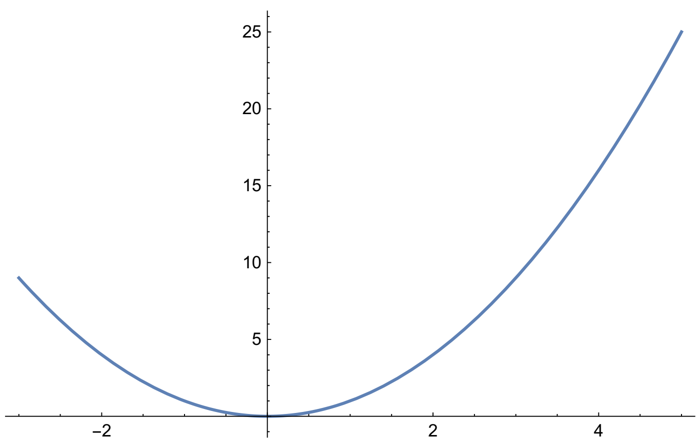
In[∘]:= `f[x_] := x^2`

In[∘]:= `f[3]`

Out[∘]= 9

In[∘]:= `Plot[f[x], {x, -3, 5}]`

Out[∘]=



In[∘]:= `D[f[x], x]`

Out[∘]= 2 x

In[•]:= `Integrate[f[x], x]`

Out[•]= $\frac{x^3}{3}$

In[•]:= `g[j_, k_] := n ! p1^j p2^k (1 - p1 - p2) ^ (n - j - k) / (j ! k ! (n - j - k) !)`

In[•]:= `g[1, 2]`

Out[•]= $\frac{p1\ (1-p1-p2)^{-3+n}\ p2^2\ n\,!}{2\ (-3+n)\,!}$

In[•]:= `Sum[i^2, {i, 0, 10}]`

Out[•]= 385

In[•]:= `Sum[i^2, {i, 0, n}]`

Out[•]= $\frac{1}{6} n\ (1+n)\ (1+2\,n)$

In[•]:= `Sum[g[j, k], {k, 0, n}]`

Out[•]= $\frac{1}{j\,!} p1^j\ (1-p1-p2)^{-1-j}\ n\,!\ \left(-\left(\left((1-p1)^n \left(\frac{-1+p1}{-1+p1+p2}\right)^{-j} (-1+p1+p2)\right) \Big/ (-j+n)\,!\right) - \left(p2^{1+n}\ \text{Hypergeometric2F1}\left[1, 1+j, 2+n, \frac{p2}{-1+p1+p2}\right]\right) \Big/ \left((-1-j)\,!\ (1+n)\,!\right)\right)$

In[•]:= `n = 3`

Out[•]= 3

In[•]:= `g[j, k]`

Out[•]= $\frac{6\ p1^j\ (1-p1-p2)^{3-j-k}\ p2^k}{j\,!\ (3-j-k)\,!\ k\,!}$

In[•]:= `p1 = .5`

Out[•]= 0.5

In[•]:= `p2 = .5`

Out[•]= 0.5

In[•]:= `g[j, k]`

Out[•]= $\frac{6 \times 0.^{3-j-k} \times 0.5^{j+k}}{j\,!\ (3-j-k)\,!\ k\,!}$

In[•]:= `Plot3d[Out[32], [{j, 0, 3}, {k, 0, 3}]]`

In[•]:= `PDF[PoissonDistribution[1]][0]`

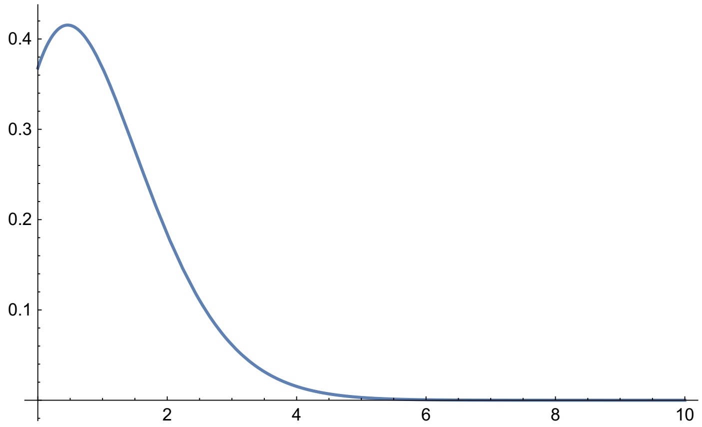
Out[•]= $\frac{1}{e}$

In[•]:= N[1/ⅇ]

Out[•]= 0.367879

In[•]:= Plot[PDF[PoissonDistribution[1]][x], {x, 0, 10}]

Out[•]=



In[•]:= Variance[PoissonDistribution[a]]

Out[•]= a

In[•]:= Sum[PDF[PoissonDistribution[1][x]], {x, 10, 100}]

Out[•]= PDF[PoissonDistribution[1][10]] +
PDF[PoissonDistribution[1][11]] + PDF[PoissonDistribution[1][12]] +
PDF[PoissonDistribution[1][13]] + PDF[PoissonDistribution[1][14]] +
PDF[PoissonDistribution[1][15]] + PDF[PoissonDistribution[1][16]] +
PDF[PoissonDistribution[1][17]] + PDF[PoissonDistribution[1][18]] +
PDF[PoissonDistribution[1][19]] + PDF[PoissonDistribution[1][20]] +
PDF[PoissonDistribution[1][21]] + PDF[PoissonDistribution[1][22]] +
PDF[PoissonDistribution[1][23]] + PDF[PoissonDistribution[1][24]] +
PDF[PoissonDistribution[1][25]] + PDF[PoissonDistribution[1][26]] +
PDF[PoissonDistribution[1][27]] + PDF[PoissonDistribution[1][28]] +
PDF[PoissonDistribution[1][29]] + PDF[PoissonDistribution[1][30]] +
PDF[PoissonDistribution[1][31]] + PDF[PoissonDistribution[1][32]] +
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PDF[PoissonDistribution[1][51]] + PDF[PoissonDistribution[1][52]] +
PDF[PoissonDistribution[1][53]] + PDF[PoissonDistribution[1][54]] +
PDF[PoissonDistribution[1][55]] + PDF[PoissonDistribution[1][56]] +

```
PDF[PoissonDistribution[1][57]] + PDF[PoissonDistribution[1][58]] +
PDF[PoissonDistribution[1][59]] + PDF[PoissonDistribution[1][60]] +
PDF[PoissonDistribution[1][61]] + PDF[PoissonDistribution[1][62]] +
PDF[PoissonDistribution[1][63]] + PDF[PoissonDistribution[1][64]] +
PDF[PoissonDistribution[1][65]] + PDF[PoissonDistribution[1][66]] +
PDF[PoissonDistribution[1][67]] + PDF[PoissonDistribution[1][68]] +
PDF[PoissonDistribution[1][69]] + PDF[PoissonDistribution[1][70]] +
PDF[PoissonDistribution[1][71]] + PDF[PoissonDistribution[1][72]] +
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PDF[PoissonDistribution[1][89]] + PDF[PoissonDistribution[1][90]] +
PDF[PoissonDistribution[1][91]] + PDF[PoissonDistribution[1][92]] +
PDF[PoissonDistribution[1][93]] + PDF[PoissonDistribution[1][94]] +
PDF[PoissonDistribution[1][95]] + PDF[PoissonDistribution[1][96]] +
PDF[PoissonDistribution[1][97]] + PDF[PoissonDistribution[1][98]] +
PDF[PoissonDistribution[1][99]] + PDF[PoissonDistribution[1][100]]
```

```
In[•]:= N[%]
```

NSum: Summand (or its derivative) PDF[PoissonDistribution[1][x]] is not numerical at point x = 46671.

NSum: Summand (or its derivative) PDF[PoissonDistribution[1][x]] is not numerical at point x = 46671.

NSum: Summand (or its derivative) PDF[PoissonDistribution[1][x]] is not numerical at point x = 46671.

General: Further output of NSum::nsnum will be suppressed during this calculation.

```
Out[•]= NSum[PDF[PoissonDistribution[1][x]], {x, 10, ∞}]
```

```
In[•]:= N[Out[44]]
```

```
Out[•]= PDF[PoissonDistribution[1.][10.]] +
PDF[PoissonDistribution[1.][11.]] + PDF[PoissonDistribution[1.][12.]] +
PDF[PoissonDistribution[1.][13.]] + PDF[PoissonDistribution[1.][14.]] +
PDF[PoissonDistribution[1.][15.]] + PDF[PoissonDistribution[1.][16.]] +
PDF[PoissonDistribution[1.][17.]] + PDF[PoissonDistribution[1.][18.]] +
PDF[PoissonDistribution[1.][19.]] + PDF[PoissonDistribution[1.][20.]] +
PDF[PoissonDistribution[1.][21.]] + PDF[PoissonDistribution[1.][22.]] +
PDF[PoissonDistribution[1.][23.]] + PDF[PoissonDistribution[1.][24.]] +
PDF[PoissonDistribution[1.][25.]] + PDF[PoissonDistribution[1.][26.]] +
PDF[PoissonDistribution[1.][27.]] + PDF[PoissonDistribution[1.][28.]] +
PDF[PoissonDistribution[1.][29.]] + PDF[PoissonDistribution[1.][30.]] +
PDF[PoissonDistribution[1.][31.]] + PDF[PoissonDistribution[1.][32.]] +
PDF[PoissonDistribution[1.][33.]] + PDF[PoissonDistribution[1.][34.]] +
```

```
PDF[PoissonDistribution[1.][35.]] + PDF[PoissonDistribution[1.][36.]] +
PDF[PoissonDistribution[1.][37.]] + PDF[PoissonDistribution[1.][38.]] +
PDF[PoissonDistribution[1.][39.]] + PDF[PoissonDistribution[1.][40.]] +
PDF[PoissonDistribution[1.][41.]] + PDF[PoissonDistribution[1.][42.]] +
PDF[PoissonDistribution[1.][43.]] + PDF[PoissonDistribution[1.][44.]] +
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PDF[PoissonDistribution[1.][69.]] + PDF[PoissonDistribution[1.][70.]] +
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PDF[PoissonDistribution[1.][73.]] + PDF[PoissonDistribution[1.][74.]] +
PDF[PoissonDistribution[1.][75.]] + PDF[PoissonDistribution[1.][76.]] +
PDF[PoissonDistribution[1.][77.]] + PDF[PoissonDistribution[1.][78.]] +
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PDF[PoissonDistribution[1.][85.]] + PDF[PoissonDistribution[1.][86.]] +
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PDF[PoissonDistribution[1.][95.]] + PDF[PoissonDistribution[1.][96.]] +
PDF[PoissonDistribution[1.][97.]] + PDF[PoissonDistribution[1.][98.]] +
PDF[PoissonDistribution[1.][99.]] + PDF[PoissonDistribution[1.][100.]]
```

```
In[•]:= Integrate[Exp[-r x] (l r) ^ (a - 1) Exp[-l r] l, {r, 0, Infinity}]
Out[•]= ConditionalExpression[l^a (l + x)^-a Gamma[a], Re[a] > 0 && Re[l + x] > 0]
```