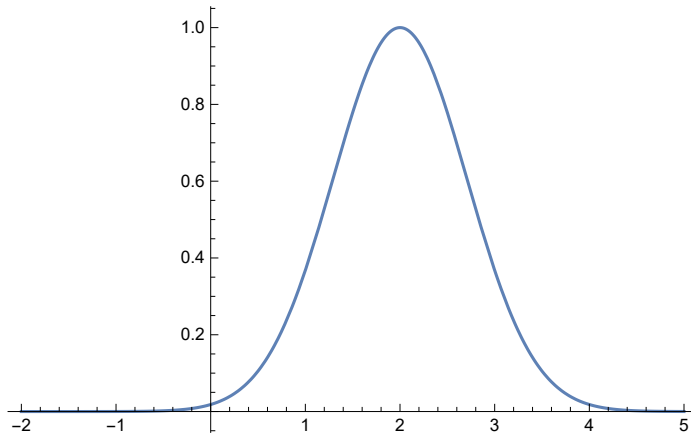```
In[1]:= f[x_] := Exp[- (x - a) ^2];
        a = 2;
        Plot[f[x], {x, -2, 5}, PlotRange → Full, PlotLegends → "Expressions"]
        NIntegrate[f[x], {x, -∞, ∞}]
```
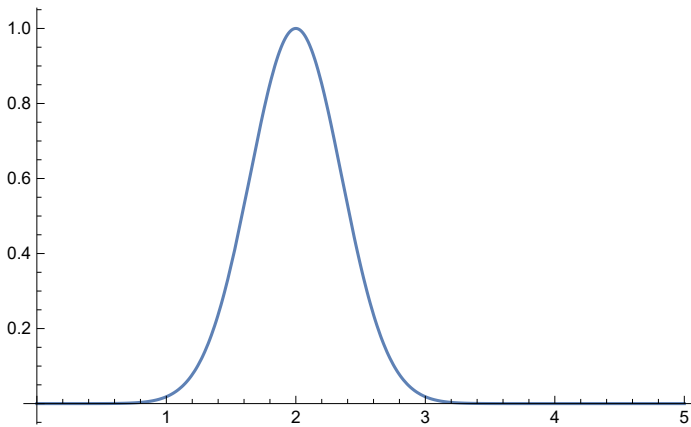
Out[3]=



Out[4]= 1.77245

```
In[5]:= f[x_, k_] := Exp[- ((x - a) ^2) / k^2];
        a = 2;
        Plot[f[x, k = 0.5], {x, 0, 5}, PlotRange → Full, PlotLegends → "Expressions"]
        NIntegrate[f[x, k = 0.5], {x, -∞, ∞}]
        2 * NIntegrate[f[x, k = 0.5], {x, -∞, ∞}]
```
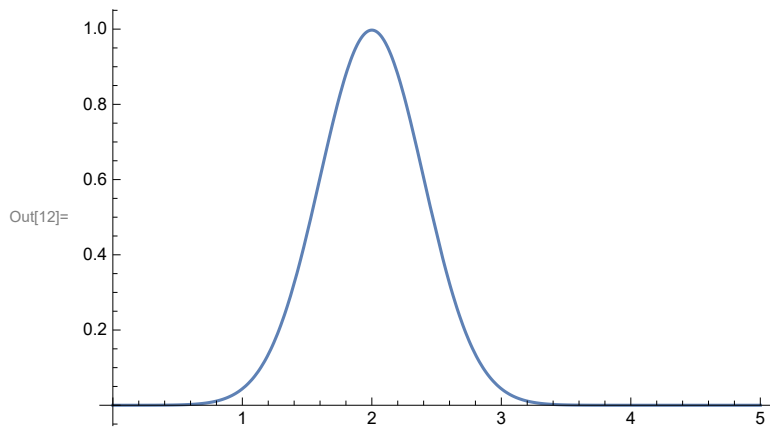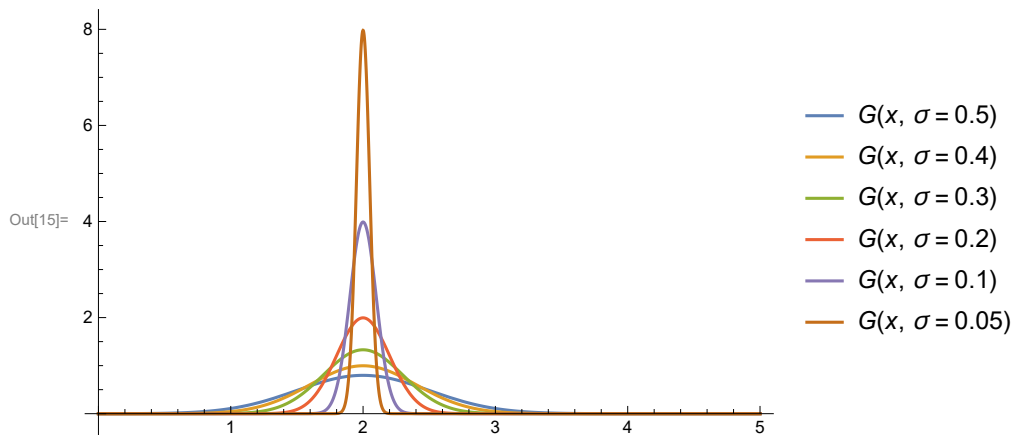
Out[7]=



Out[8]= 0.886227

Out[9]= 1.77245

In[10]:= `G[x_] := (1 / (σ * Sqrt[2 Pi])) Exp[-((x - a)^2) / (2 σ^2)];`
`a = 2; σ = 0.4;`
`Plot[G[x], {x, 0, 5}]`

Out[12]=



In[13]:= `G[x_, σ_] := (1 / (σ * Sqrt[2 Pi])) Exp[-((x - a)^2) / (2 σ^2)];`
`a = 2;`
`Plot[{G[x, σ = 0.5], G[x, σ = 0.4], G[x, σ = 0.3], G[x, σ = 0.2], G[x, σ = 0.1],`
`   G[x, σ = 0.05]}, {x, 0, 5}, PlotRange → Full, PlotLegends → "Expressions"]`
`NIntegrate[G[x, σ = 0.5], {x, -∞, ∞}]`
`NIntegrate[G[x, σ = 0.05], {x, -∞, ∞}]`

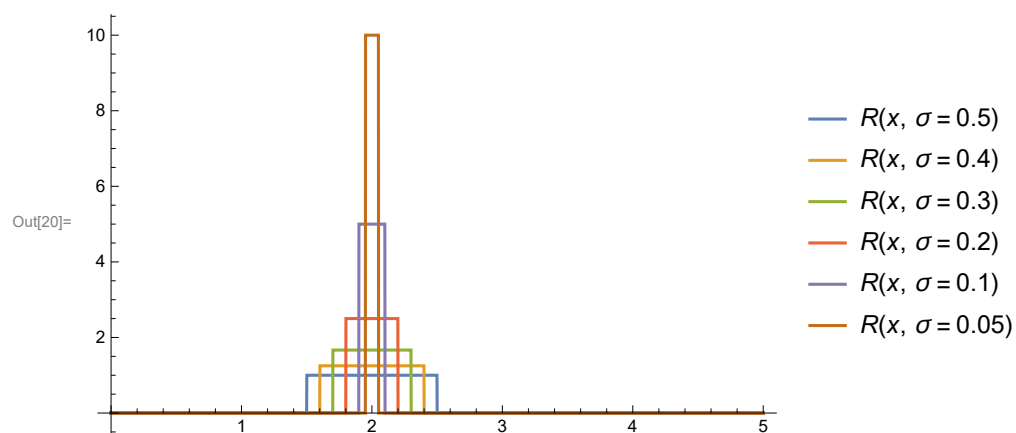··· General: Exp[–799.918] is too small to represent as a normalized machine number; precision may be lost.

Out[15]=



Out[16]= `1.`

Out[17]= `1.`

In[18]:= `R[x_, σ_] := Piecewise[{{1 / (2 σ), -σ < x - a < σ}, {0, Modulus[x - a] > σ}}];`
`a = 2;`
`Plot[{R[x, σ = 0.5], R[x, σ = 0.4], R[x, σ = 0.3], R[x, σ = 0.2], R[x, σ = 0.1],`
`  R[x, σ = 0.05]}, {x, 0, 5}, PlotRange → Full, PlotLegends → "Expressions"]`
`NIntegrate[R[x, σ = 0.5], {x, -∞, ∞}]`
`NIntegrate[R[x, σ = 0.05], {x, -∞, ∞}]`

Out[20]=



Out[21]= **1.**

Out[22]= **1.**

In[23]:=