```
> restart;
> with( plots ) :
```

Examples of Dirac's Delta functions

```
> f := 1/sqrt(n^2·π) ·e^(-(x-α)^2/n^2) ;
```

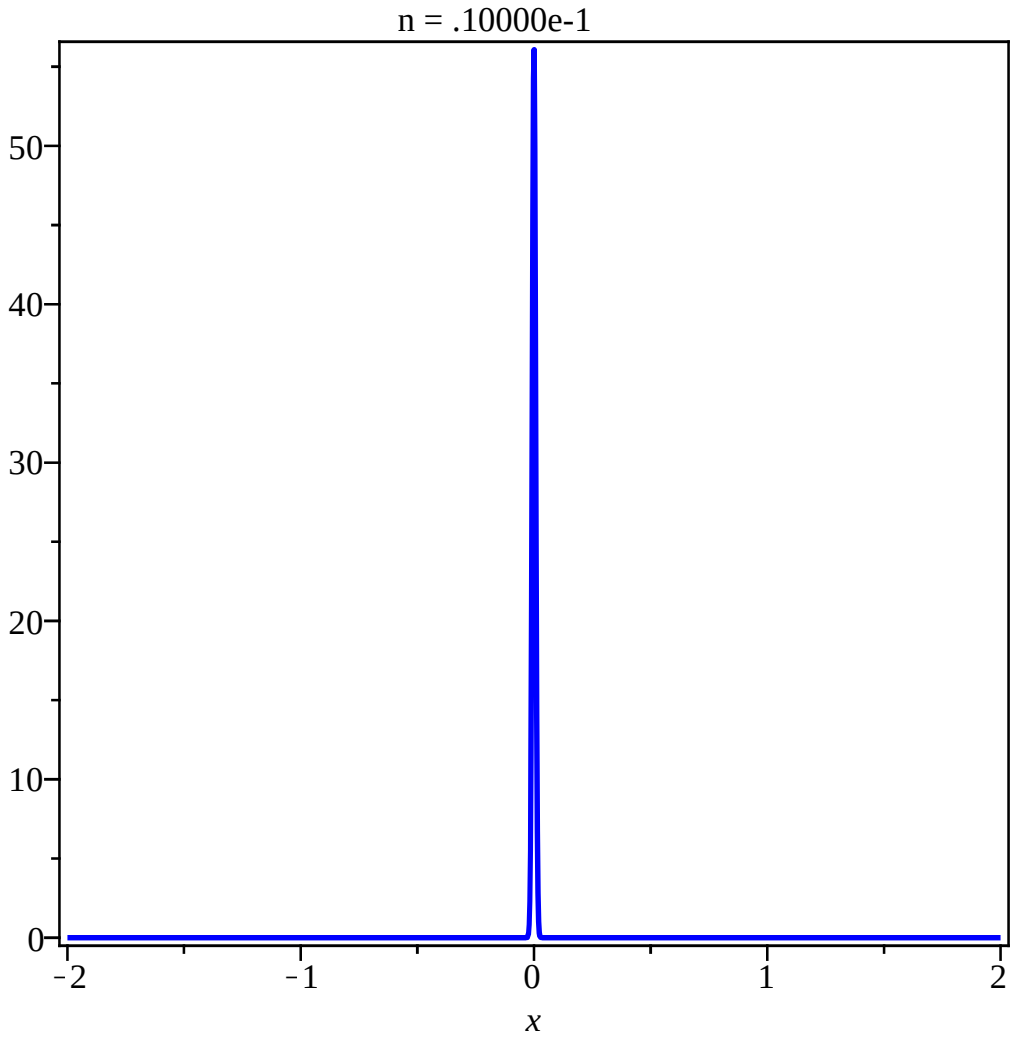
$$f := \frac{e^{-\frac{(x-\alpha)^2}{n^2}}}{\sqrt{n^2\,\pi}} \tag{1}$$

```
> α := 0;
  y := f;
```

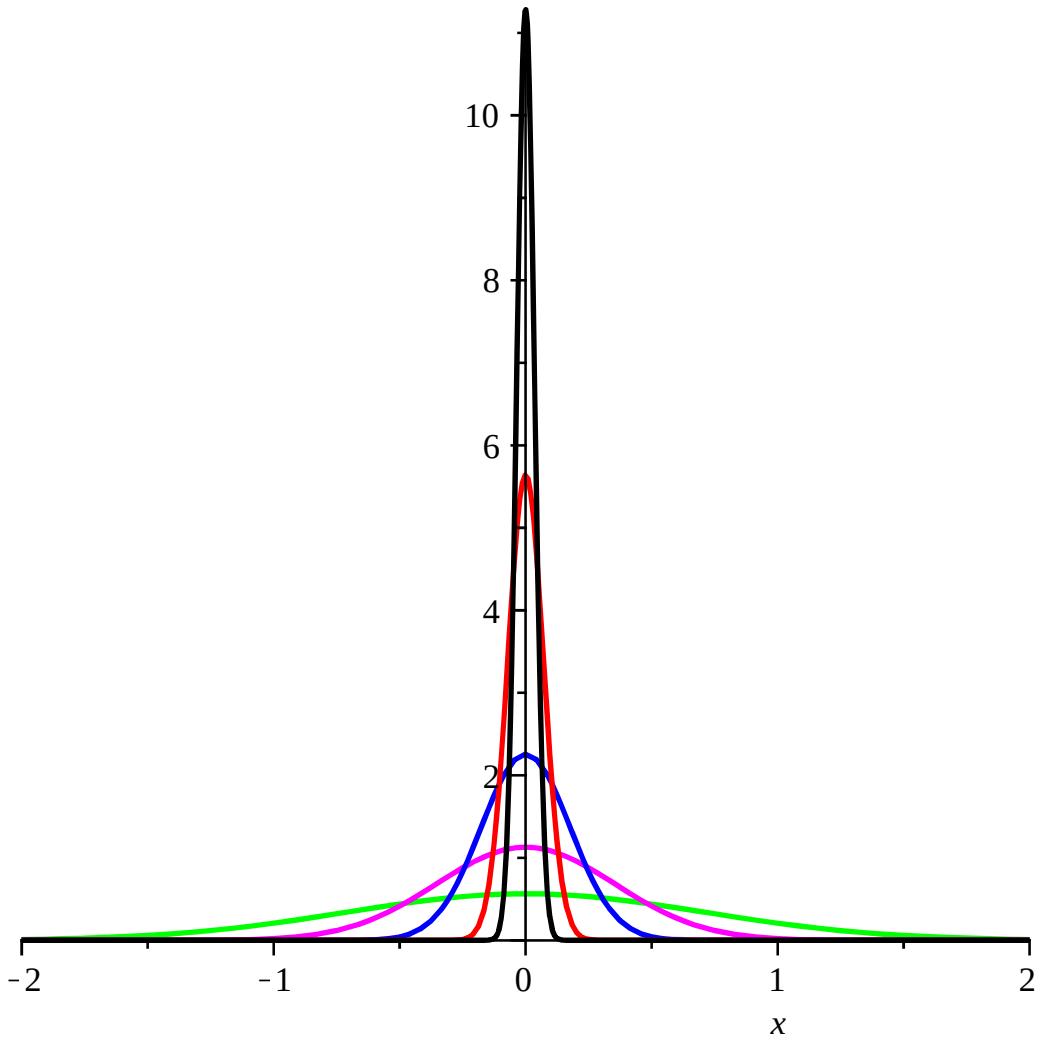
$$\alpha := 0$$

$$y := \frac{e^{-\frac{x^2}{n^2}}}{\sqrt{n^2\,\pi}} \tag{2}$$

```
> animate( plot, [y, x = -2 ..2, color = blue, thickness = 2, axes = boxed], n = 1 ..0.01 );
```



```
> n := 1 :
  a := plot(y, x = -2 ..2, color = green, thickness = 2) :
  n := 0.50 :
  b := plot(y, x = -2 ..2, color = magenta, thickness = 2) :
  n := 0.25 :
  c := plot(y, x = -2 ..2, color = blue, thickness = 2) :
  n := 0.10 :
  d := plot(y, x = -2 ..2, color = red, thickness = 2) :
  n := 0.05 :
  e := plot(y, x = -2 ..2, color = black, thickness = 2) :
  display([a, b, c, d, e]);
```




```
> 'int(y dx, x = -infinity .. +infinity)' = int(y dx, x = -infinity .. +infinity);
```

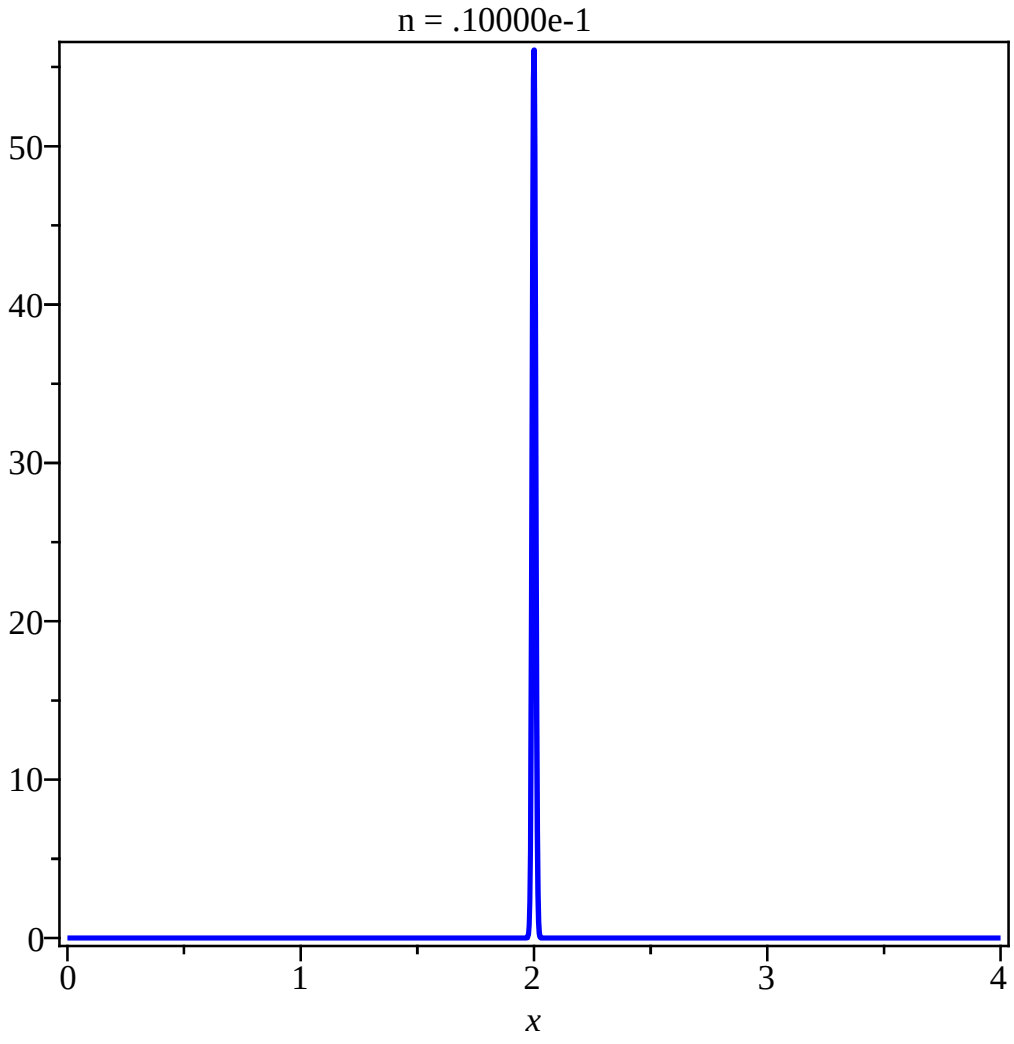
$$\int_{-\infty}^{\infty} y\,dx = 1. \qquad \textbf{(3)}$$

```
> n :='n': #  clear n
> α := 2;
  y := f;
```

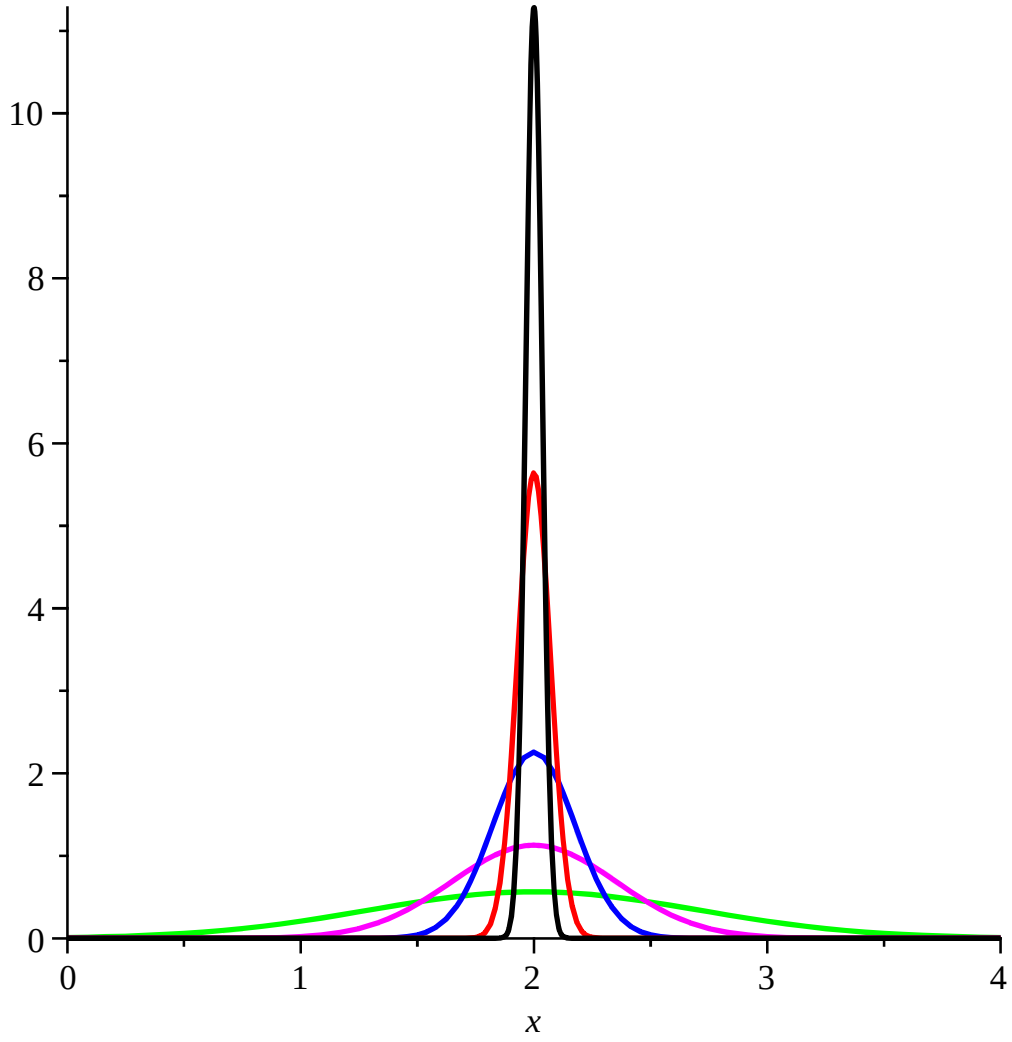
$$\alpha := 2$$

$$y := \frac{e^{-\frac{(x-2)^2}{n^2}}}{\sqrt{n^2 \pi}} \tag{4}$$

```
> animate( plot, [y, x = 0 ..4, color = blue, thickness = 2, axes = boxed], n = 1 ..0.01 );
```



```
> n := 1 :
  a := plot(y, x = 0 ..4, color = green, thickness = 2) :
   n := 0.50 :
   b := plot(y, x = 0 ..4, color = magenta, thickness = 2) :
   n := 0.25 :
   c := plot(y, x = 0 ..4, color = blue, thickness = 2) :
   n := 0.10 :
   d := plot(y, x = 0 ..4, color = red, thickness = 2) :
   n := 0.05 :
   e := plot(y, x = 0 ..4, color = black, thickness = 2) :
    display([a, b, c, d, e]);
```




```
> '∫_{-∞}^{+∞} y dx' = ∫_{-∞}^{+∞} y dx;
```

$$\int_{-\infty}^{\infty} y\,dx = 1. \qquad \textbf{(5)}$$