Demo for example 9.6.2, plucked string animation

```
> with(plots):
> a:=2; b:=1; L:=10;
```

$$a := 2$$

$$b := 1$$

$$L := 10 \tag{1.1}$$

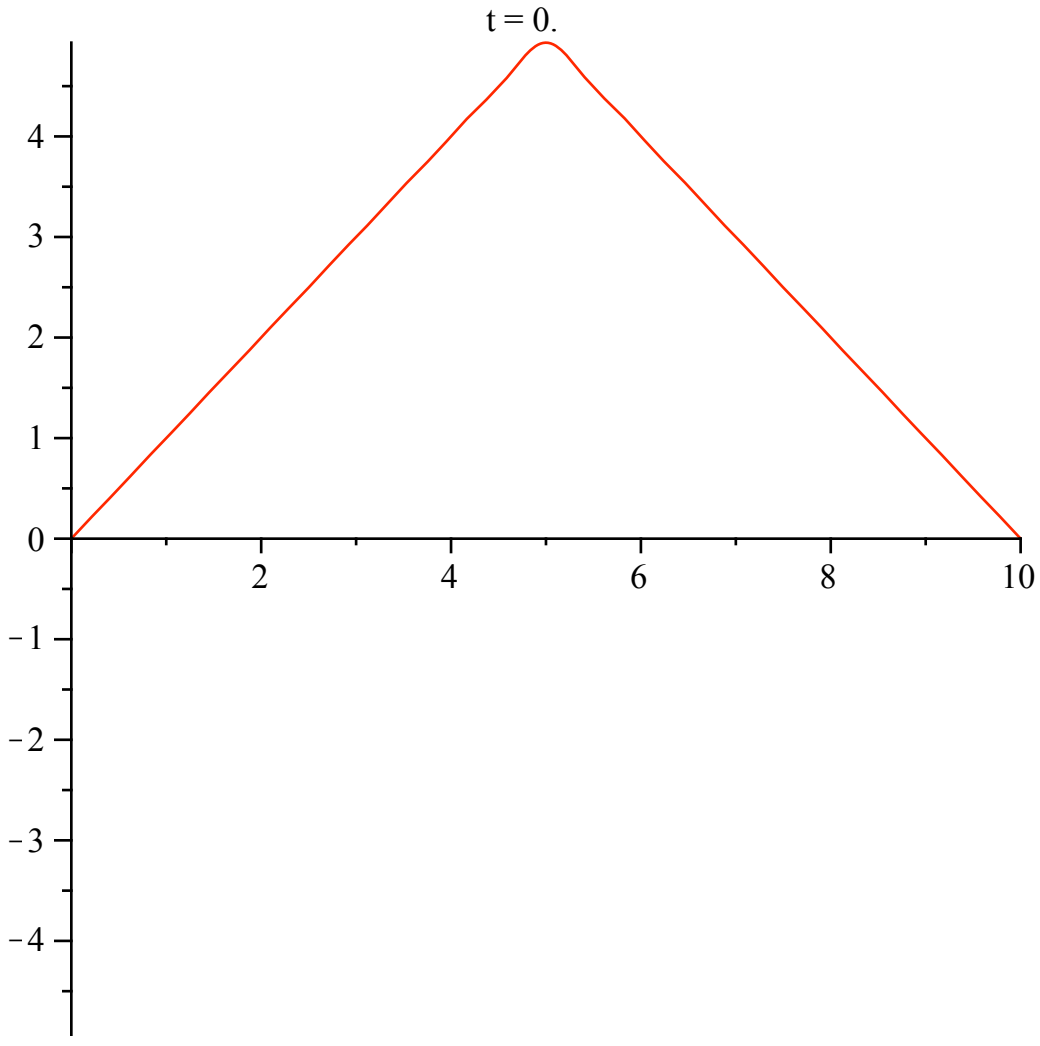
```
> A(n) := 4*b*L/(n*Pi)^2 * sin(n*Pi/2);
```

$$A(n) := \frac{40 \sin\left(\frac{1}{2} n \pi\right)}{n^2 \pi^2} \tag{1.2}$$

```
> y := (x,t,N) -> sum( A(n)*cos(n*Pi*a*t/L) * sin(n*Pi*x/L) ,
  n=1..N);
```

$$y := (x, t, N) \rightarrow \sum_{n=1}^{N} A(n) \cos\left(\frac{n \pi a t}{L}\right) \sin\left(\frac{n \pi x}{L}\right) \tag{1.3}$$

```
> animate(plot,[y(x,t,30),x=0..L],t=0..20);
```

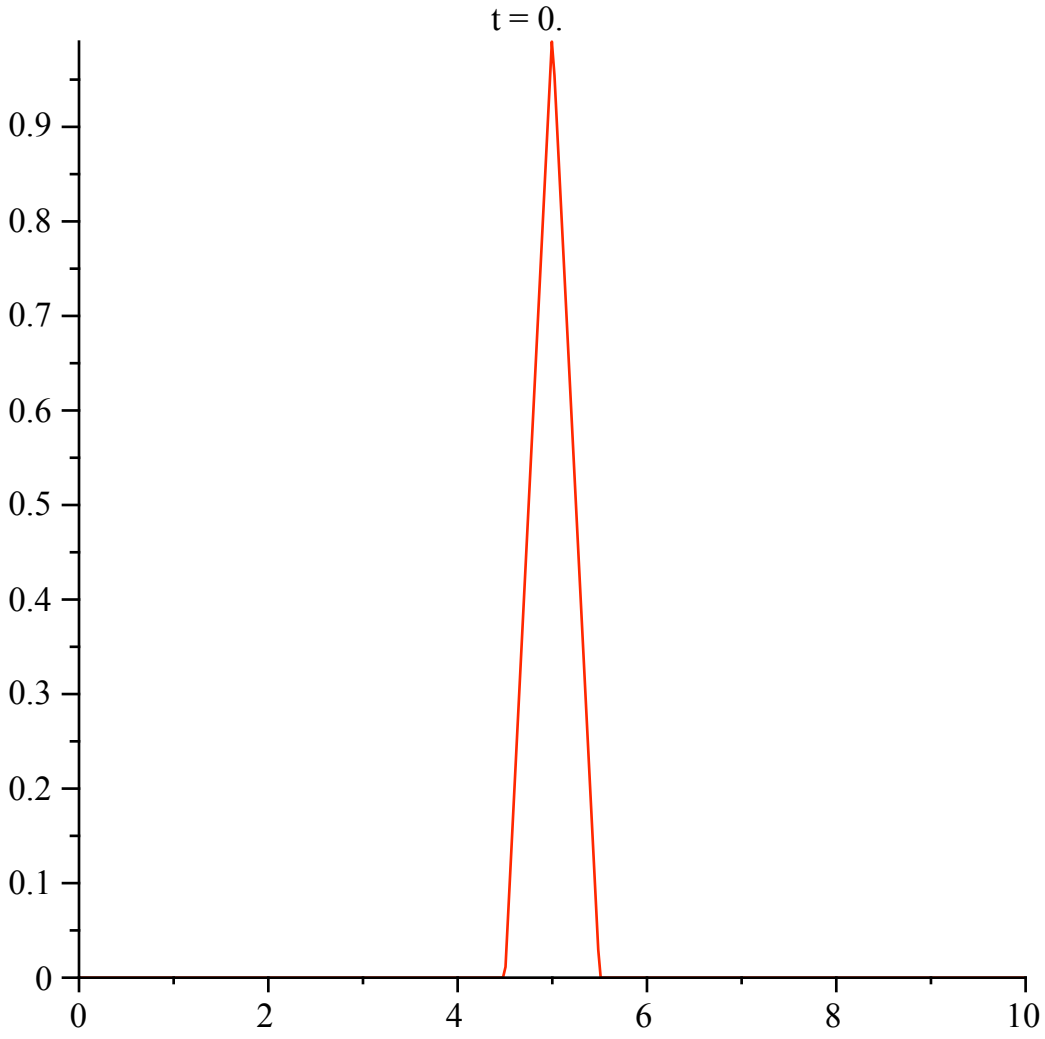


Demo for D'Alembert's solution

```
> f := x -> piecewise(4.5 <= x and x < 5, 2*(x-4.5), 5 <= x and
  x <= 5.5, 2*(5.5-x));
```

$$f := t \rightarrow piecewise(4.5 \le t \text{ and } t < 5, 2\,t - 2 \cdot 4.5, 5 \le t \text{ and } t \le 5.5, 2 \cdot 5.5 - 2\,t) \qquad (2.1)$$

```
> animate(plot, [ 0.5* (f(x-a*t) + f(x+a*t)),x=0..10],t=0..2);
```




```
>
```