1 FONCTION ET EXPRESSION

2 a:=x^2+2

$$x^2+2$$

3 f:=x->x^2+2

```
// Sucess
// End defining f
```

$$x \to x^2+2$$

4 a(32)

$$(x(32))^2+2$$

5 f(32)

$$1026$$

6 g:=unapply(a,x)

$$x \to x^2+2$$

7 g(32)

$$1026$$

8 CALCUL DIFFERENTIEL

9 F:=x->sin(4*x^3)

```
// Sucess
// End defining F
```

$$x \to \sin(4 \cdot x^3)$$

10 diff(F(x))

$$((\cos(4 \cdot x^3) \cdot 4) \cdot 3) \cdot x^2$$

11 simplify(diff(F(x),x$3))

$$((-1728) \cdot x^6) \cdot \cos(4 \cdot x^3) - (864 \cdot x^3) \cdot \sin(4 \cdot x^3) + 24 \cdot \cos(4 \cdot x^3)$$

12 f:=simplify(fonction_derivee(F))

```
// Sucess
```

$$`x` \to (12 \cdot `x`^2) \cdot \cos(4 \cdot `x`^3)$$

13 f(32)

$$12288 \cdot \cos(131072)$$

14 ÉQUATIONS DIFFÉRENTIELLES

15 dsolve(y''+y=0,y)

$$c\_0 \cdot \cos(x) + c\_1 \cdot \sin(x)$$

16 dsolve([y''+y=0,y'(0)=1,y(0)=2],y)

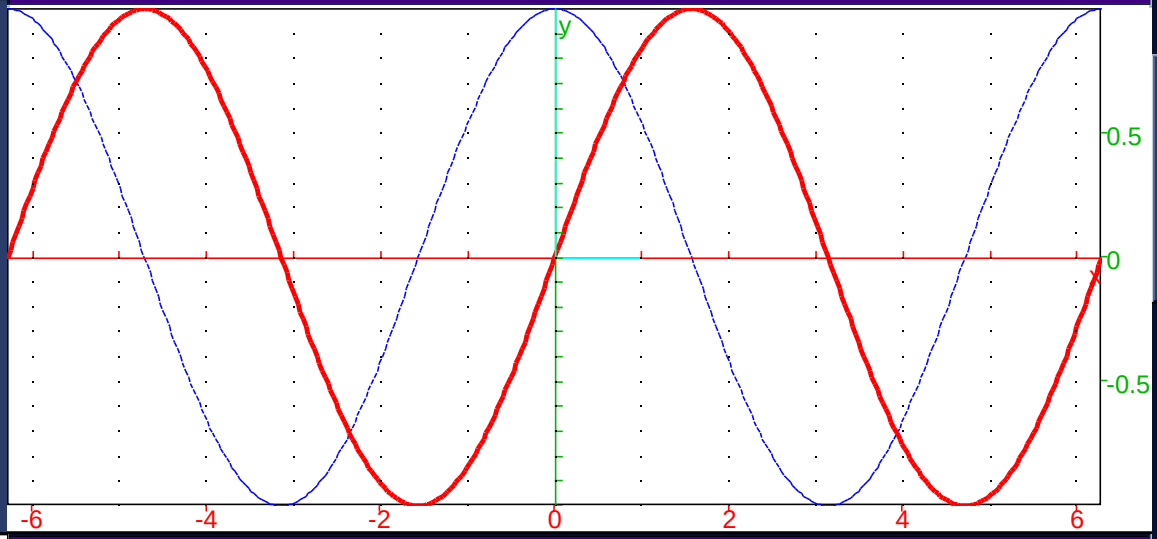
$$[2 \cdot \cos(x) + \sin(x)]$$

17 dsolve([R*q'+(1/C)*q=E,q(0)=0],q)

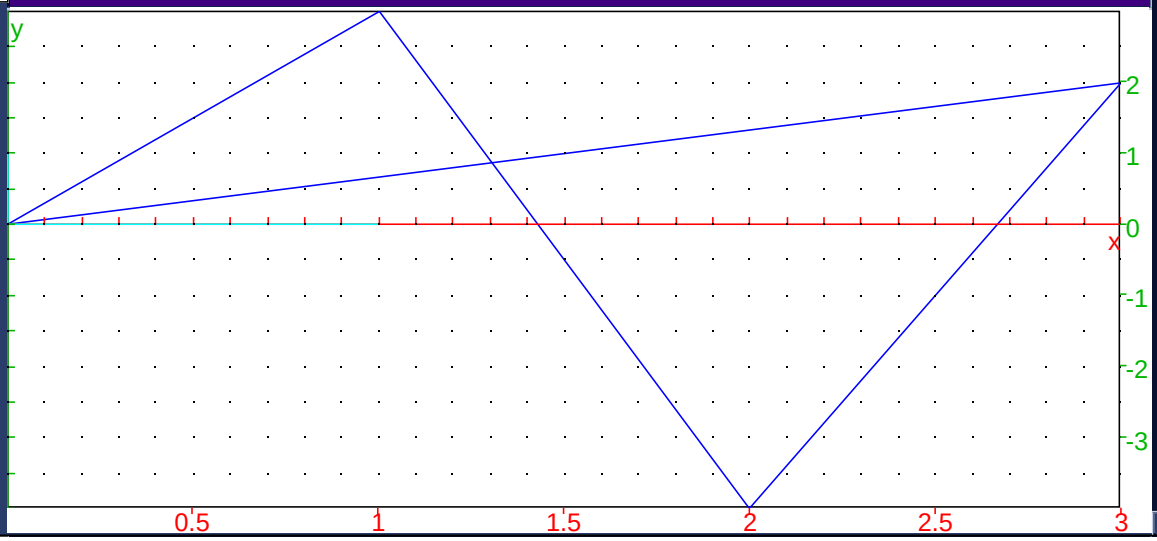
$$\left[\frac{(C\cdot E)\cdot\exp\left(\frac{x}{R\cdot C}\right)-E\cdot C}{\exp\left(\frac{x}{R\cdot C}\right)}\right]$$

18 GRAPHES

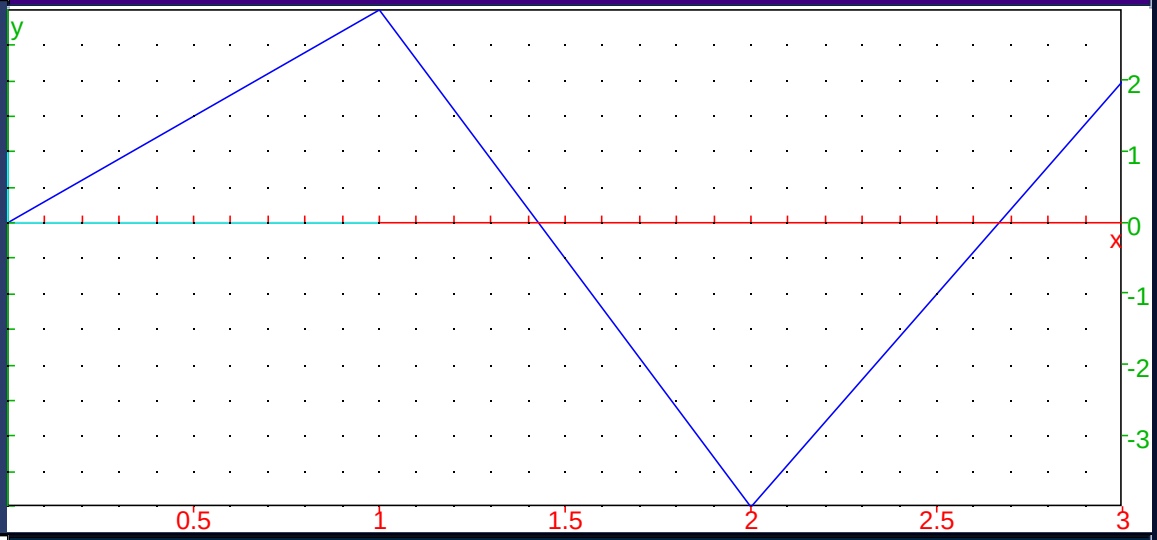
19 plot([cos(x),sin(x)],x=-2*Pi..2*Pi,color=[blue+dash_line,red+line_width_3])



20 couleur(polygone(point(0,0),point(1,3),point(2,-4),point(3,2)),bleu)

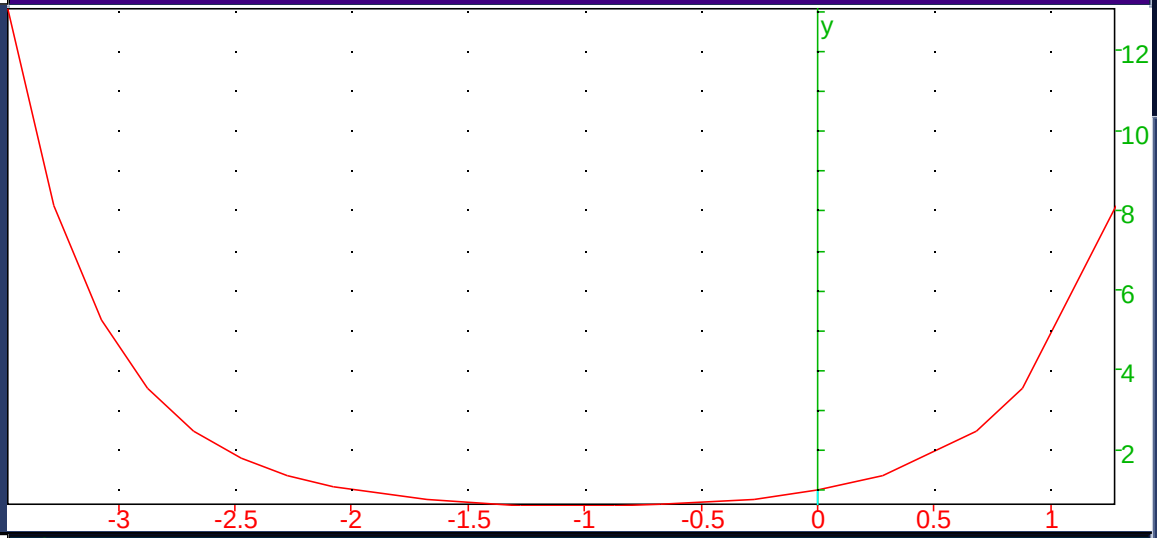


21 couleur(polygone_ouvert(point(0,0),point(1,3),point(2,-4),point(3,2)),bleu)



22 odeplot(f(t,y),[t,y],[t0,y0)) trace la solution de y'=f(t,y) et y(t0)=y0

23 couleur(odeplot((t+1)*y,[t,y],[0,1]),rouge)



24 MÉTHODE D'EULER

25 Prog Edit Ajouter nxt OK Save

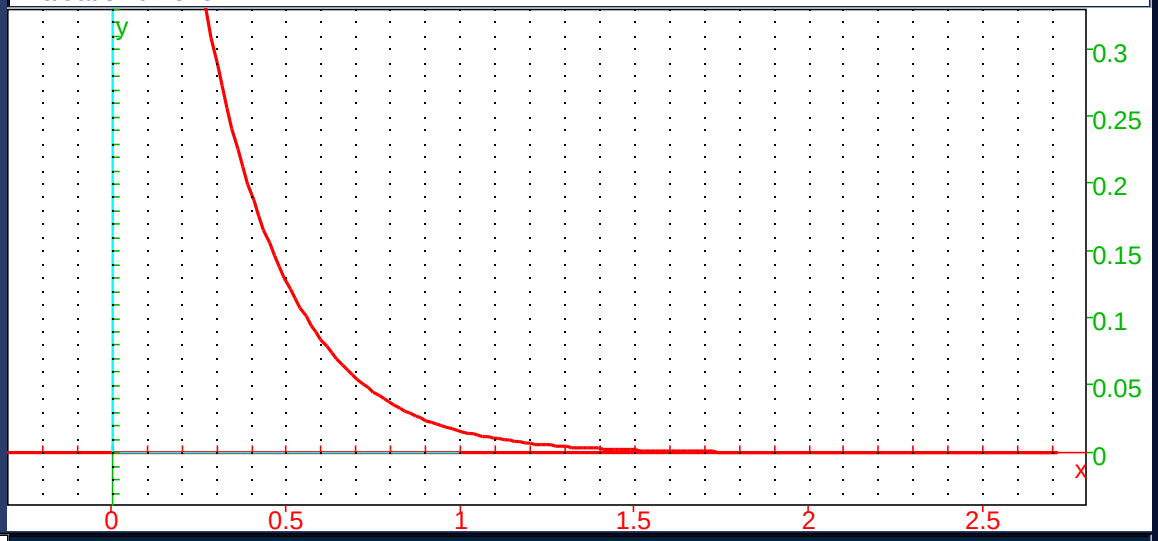
```
eu(alpha,N,a,b,uo):= {
local S,X,Y,k,Cnum,Cexact,sexact,u,P,t,x,y;
S:=NULL;
X:=a;
Y:=uo;
for(k:=0;k<=N;k++) {
X:=a+k*(b-a)/N;
Y:=uo*(1+alpha*(b-a)/N)^k;
P:=point(X,Y);
S:=S,P;
}
//sexact:=dsolve([y'=alpha*y,y(0)=uo],y)[0]:;
Cnum:=couleur(polygone_ouvert(S),rouge+line_width_2);
//Cexact:=couleur(plot(sexact,x=a..b),bleu+dash_line);
}:;
```

```
// Parsing eu
// Sucess compiling eu
```

Done

26 eu(-4,200,0,3,1)

Evaluation time: 0.12



27 Et de maniŁre plus gØnØrale

28 Prog Edit Ajouter nxt OK Save

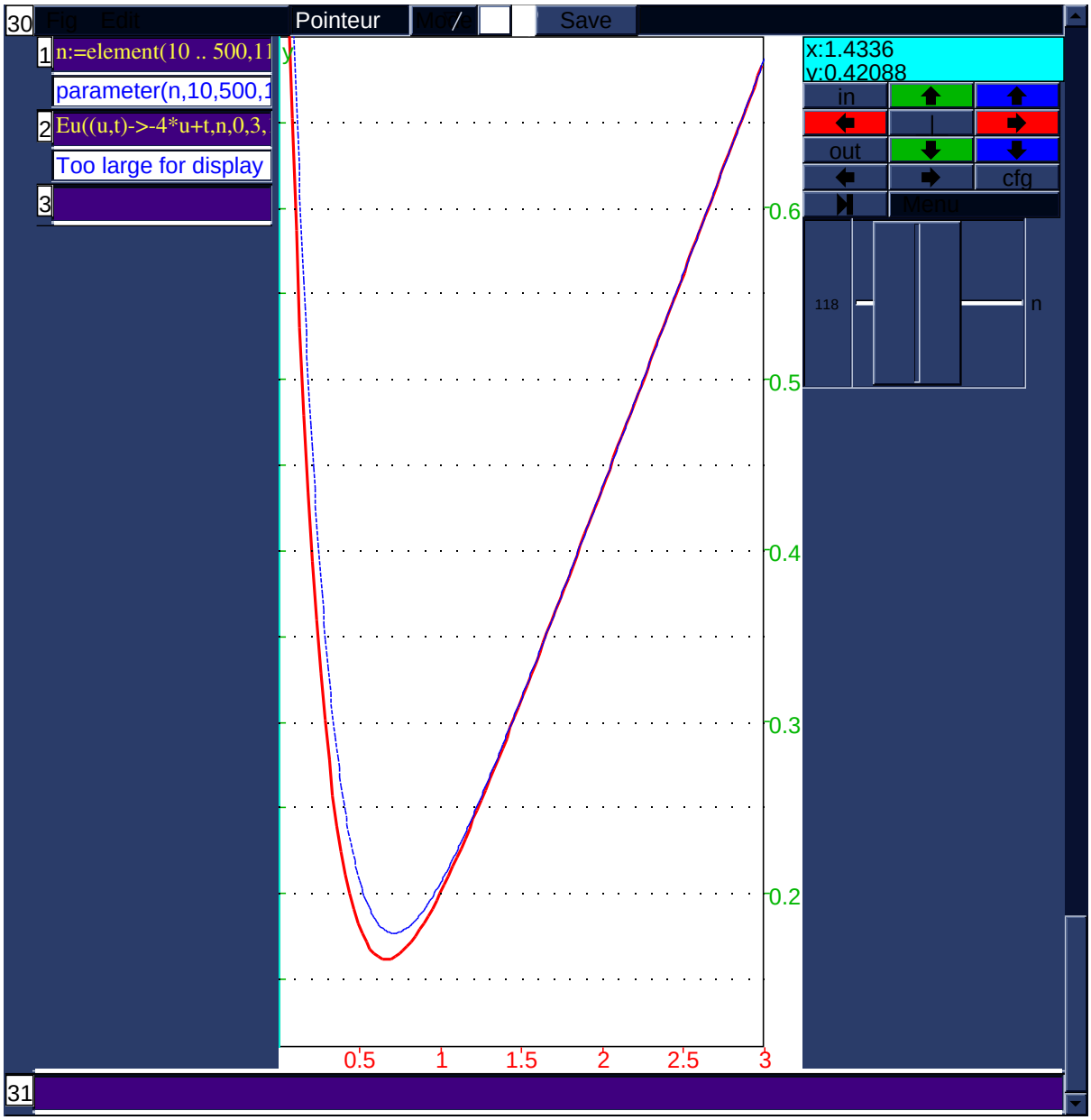
```
Eu(f,N,a,b,uo):= {
local S,X,Y,k,Cnum,Cexact,sexact,u,P,t;
S:=NULL;
X:=a;
Y:=uo;
for(k:=0;k<=N;k++) {
Y:=Y+f(Y,X)*(b-a)/N;
X:=a+k*(b-a)/N;
P:=point(X,Y);
S:=S,P;
}
sexact:=dsolve([y'=f(y,x),y(0)=uo],y)[0]:;
Cnum:=couleur(polygone_ouvert(S),rouge+line_width_2):;
Cexact:=couleur(plot(sexact,x=a..b),bleu+dash_line):;
Cnum,Cexact:
```

```
// Parsing Eu
// Warning: y x  declared as global variable(s) compiling Eu
```

Done

Menu

29


30
Fig
Edit
Pointeur
Mode
/
Save
1
n:=element(10 .. 500,1
parameter(n,10,500,1
2
Eu((u,t)->-4*u+t,n,0,3,
Too large for display
3
x:1.4336
v:0.42088
in
out
cfg
Menu
118
n
0.6
0.5
0.4
0.3
0.2
0.5
1
1.5
2
2.5
3
31