Correction du TD 2

Les exercices de familarisation ne sont pas corrigés.

Autour de la dérivabilité

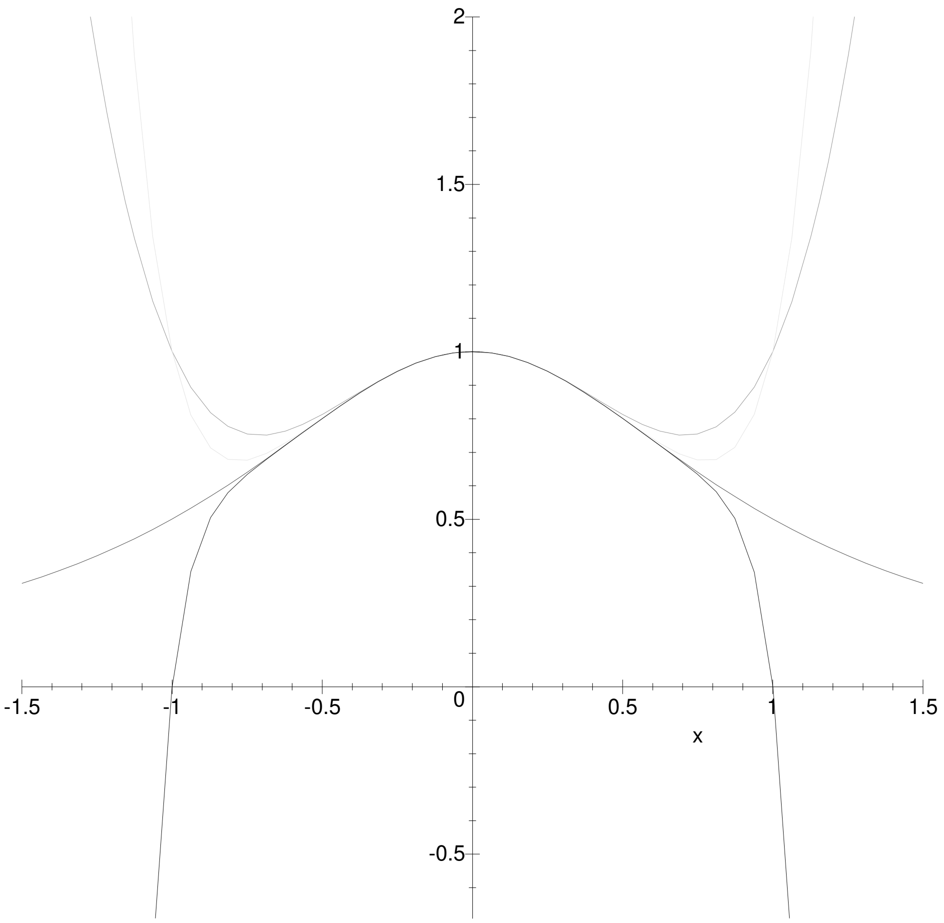
```
> f:=x->x^x:
  'f(0)'=limit(f(x), x=0);
  'D'(f)(0)=limit((f(x)-1)/x, x=0);
  plot(f, 0..2):
```

$$f(0) = 1$$

$$D(f)(0) = -\infty$$

```
> taylorapp:=proc(f, x0, xmin, xmax)
    local devtaylor, k, ymin, ymax;
    devtaylor:=seq(convert(taylor(f(x), x=x0, 5*k), polynom), k=1..3);
    ymin:=minimize(f(x), x, evalf(xmin)..evalf(xmax));
    ymax:=maximize(f(x), x, evalf(xmin)..evalf(xmax));
    plot([f(x), devtaylor], x=xmin..xmax, ymin-1..ymax+1);
  end:

> taylorapp(x->x^11, 1/2, -1, 1):
> taylorapp(sin, 0.5, -2*Pi, 2*Pi):
> taylorapp(x->1/(1+x^2), 0, -3/2, 3/2);
```




```
> taylorapp(x->exp(-1/x^2), 0, -1, 1);
Error, (in series/exp) unable to compute series
> plot({exp(-1/x^2), 0}, x=-1..1):
```

Problème pilote de l'X

```
> n:=10: a:=table():
  for i from 0 to n do a[i]:=rand(256)(): od:
  MAX_VALUE:=infinity: MIN_VALUE:=-infinity:
> meilleureVente:=proc()
    global a, n, MIN_VALUE;
    local max, i;
    max:=MIN_VALUE;
    for i from 0 to n-1 do
      if a[i]>max then
        max:=a[i]
      fi
    od;
    max
  end:
> barycentre:=proc(k)
    global a, n, MIN_VALUE, MAX_VALUE;
    local max, min, i;
    max:=MIN_VALUE; min:=MAX_VALUE;

    for i from 0 to n-1 do
      if a[i]>max then max:=a[i] fi;
      if a[i]<min then min:=a[i] fi
    od;
    evalf((k*max+(n-k)*min)/n)
  end:
> kMeilleureVente:=proc(k)
    global a, n;
    local i, j, jmax, t;

    for i from 0 to k-1 do
      jmax:=i;
      for j from i+1 to n-1 do
        if a[j] > a[jmax] then
          jmax:=j
        fi
      od;
      t:=a[i]; a[i]:=a[jmax]; a[jmax]:=t;
    od;
    a[k-1]
  end:
```