

# Correction du TD n°6

## Exercice 1 :

```

ba) program integrale;
const n=20; a=1; b=2.5;
var i:integer;
    s,dx:real;
function f1(y:real):real;
begin
    f1:=2+y*(8+y*(-6+y));
end;
function f2(z:real):real;
begin
    f2:=sin(z);
end;
BEGIN
    dx:=(b-a)/n;
    s:=0;
    for i:=0 to n-1 do
        s:=s+dx*f1(a+i*dx);
        writeln('int=',s);
        readln;
    END.
bb) for i:=1 to n do
        s:=s+dx*f1(a+i*dx);
bc) for i:=0 to n-1 do
        s:=s+dx*f1(a+(i+0.5)*dx);

```

## Exercice 2 :

```

a) for i:=0 to n-1 do
    s:=s+dx*(f1(a+i*dx)+f1(
        a+(i+1)*dx))/2;

```

## Exercice 3 :

```

program dichotomie;
var a,b,c,eps:real;
function f(x:real):real;
begin
    f:=exp(2*x-1)-2;
end;
begin
    a:=0; b:=1;
    writeln('epsilon?');
    readln(eps);
    while(b-a)>eps do
        begin
            c:=(b+a)/2;
            if f(c)=0 then
                begin
                    a:=c; b:=c;
                end
            else if f(c)*f(a)<0 then b:=c
                else a:=c;
        end;
    write('la racine est entre ',a,' et ',b);
    readln;
end.

```

```

else if f(c)*f(a)<0 then b:=c
    else a:=c;
end;
write('la racine est entre ',a,' et ',b);
readln;
end.

```

## Exercice 4 :

a)  $f$  est  $C^2$ ,  $f' > 0$ ,  $f(0).f(1) < 0$ . On peut donc faire de la dichotomie sur  $[0,1]$ .

## Exercice 6 :

```

program cordnew;
var a,b,c,d,eps:real;
function f(x:real):real;
begin
    f:=exp(2*x-1)-2;
end;
function fprime(x:real):real;
begin
    fprime:=2*exp(2*x-1);
end;
function corde(a,b:real):real;
begin
    corde:=a+(a-b)/(f(b)/f(a)-1);
end;
function newton(a,b:real):real;
begin
    newton:=b-f(b)/fprime(b);
end;
begin
    a:=0; b:=1; c:=a; d:=b;
    eps:=0.00000001;
    while (b-a)>eps do
        begin
            c:=corde(a,b); a:=c;
            d:=newton(a,b); b:=d;
        end;
    writeln('racine entre ',a,' et ',b);
    readln;
end.

```

## Exercice 7 :

```

program iteration;
var a,b:real;
begin
    a:=0;
    b:=cos(a);
    while (b-a)>0.000000001 do
        begin
            a:=cos(b); b:=cos(a);
        end;
    write('solution entre ',a,' et ',b);
    readln;
end.

```

