```
> N:=5;
  i:=2;
```

$$N := 5$$
$$i := 2 \quad (1)$$

```
> T:=1;
```

$$T := 1 \quad (2)$$

```
> for j from 1 to N  do
  if (j<>i) then T:= T*(x-a||j)
  fi;
  od;
```

```
> T;
```

$$(x - a1)\ (x - a3)\ (x - a4)\ (x - a5) \quad (3)$$

```
> with(LinearAlgebra):
  v:=Vector(N+1);
  for j from 0 to N do v[j+1]:=j/N; od:
```

$$v := \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} \quad (4)$$

```
> v;
```

$$\begin{bmatrix} 0 \\ \frac{1}{5} \\ \frac{2}{5} \\ \frac{3}{5} \\ \frac{4}{5} \\ 1 \end{bmatrix} \quad (5)$$

```
> L :=  proc( N::integer, i::integer, v::Vector, x)
          description "Lagrange function";
  local j,T;
  T:=1:
  for j from 0 to N do
  if (j<>i) then T:= T*(x-v[j+1])/(v[i+1]-v[j+1])
  fi;
  od;
  T;
  end proc;
```

$L := \mathbf{proc}(N::integer, i::integer, v::Vector, x)$ (6)

```
  local j, T;
  description "Lagrange function";
  T := 1; for j from 0 to N do
      if j <> i then T := T* (x - v[j + 1]) / (v[i + 1] - v[j + 1]) end if
```

```
    end do;
    T
end proc
```

```
> L(5,2,v,2);
```

$$-1575 \tag{7}$$

```
> int(L(5,2,v,x),x=0..1);
```

$$\frac{25}{144} \tag{8}$$

```
> for N from 1 to 4 do
  print(N);
  v:=Vector(N+1):
  for j from 0 to N do v[j+1]:=j/N; od:
  for i from 0 to N do
  print(int(L(N,i,v,x),x=0..1));
  od: od:
```

$$1$$
$$\frac{1}{2}$$
$$\frac{1}{2}$$
$$2$$
$$\frac{1}{6}$$
$$\frac{2}{3}$$
$$\frac{1}{6}$$
$$3$$
$$\frac{1}{8}$$
$$\frac{3}{8}$$
$$\frac{3}{8}$$
$$\frac{1}{8}$$
$$4$$
$$\frac{7}{90}$$
$$\frac{16}{45}$$
$$\frac{2}{15}$$
$$\frac{16}{45}$$
$$\frac{7}{90} \tag{9}$$