```
directorio = Directory[]
```
directorio

$$\text{ftest}[z\_] = \frac{z + \frac{1}{z}}{2} \text{Sin}\left[1 \Big/ \left(\frac{z + \frac{1}{z}}{2}\right)\right]$$
seno

```
Attributes[ftest] = {Listable}
```
atributos listable

```
(* random.wls obtains the system of arcs related with
 the random device and write it as arcosalpha *)

n = 100; T = 2 * Pi;
```
número pi

```
Get["Dropbox/articulo2023/random.wls"]
```
recibe

```
(* arcos.wls obtains all the system of
 arcs related with arcosalpha in the sense of
 the paper and the related nodal systems *)
Get["Dropbox/atypeofinterpolation2023/arcos.wls"]
```
recibe

```
(* derivadas.wls obtains the derivatives
 used in the paper for a nodal system in T *)
listaalpha = alphaW2n;
listaarcosalpha = arcosalphaW2n;
Get["Dropbox/atypeofinterpolation2023/derivadas.wls"];
```
recibe

```
derivadasalphaW2n = derivadas;
derivadassegundasalphaW2n =
  derivadas * factoresderivadassegundas;

(* same comment as before *)
listaalpha = alphaYn;
listaarcosalpha = arcosalphaYn;
Get["Dropbox/atypeofinterpolation2023/derivadas.wls"];
```
recibe

```
derivadasalphaYn = derivadas;
derivadassegundasalphaYn =
```

```
  derivadas * factoresderivadassegundas;
```

```
(* same comment as before *)
listaalpha = alphaZn;
listaarcosalpha = arcosalphaZn;
Get["Dropbox/atypeofinterpolation2023/derivadas.wls"];
```

recibe

```
derivadasalphaZn = derivadas;
derivadassegundasalphaZn =
  derivadas * factoresderivadassegundas;

(* u and v in the sense of the paper *)
u = ftest[alphaW2n]; v = ftest'[alphaW2n];

(* semi Hermite and semi Hermite-
 Fejer interpolants usin the barycentric formulae*)

SHFejer[z_] =
  (Sum[(alphapwp[[2 k]] * derivadasalphaZn[[k]] * u[[2 k]])/
      ((z - alphaW2n[[2 k]]) (derivadasalphaW2n[[2 k]])^2 +
     (alphapwp[[2 k - 1]] /
        ((z - alphaW2n[[2 k - 1]]) derivadasalphaW2n[[2 k - 1]] *
          derivadasalphaYn[[k]])) (1/(z - alphaW2n[[2 k - 1]]) -
        derivadassegundasalphaW2n[[2 k - 1]]/
          (2 derivadasalphaW2n[[2 k - 1]]) -
        derivadassegundasalphaYn[[k]]/(2 derivadasalphaYn[[k]]) +
        3 n/2) u[[2 k - 1]]), {k, 1, n}]) /
   (Sum[(alphapwp[[2 k]] * derivadasalphaZn[[k]])/
      ((z - alphaW2n[[2 k]]) (derivadasalphaW2n[[2 k]])^2 +
     (alphapwp[[2 k - 1]] /
        ((z - alphaW2n[[2 k - 1]]) derivadasalphaW2n[[2 k - 1]] *
          derivadasalphaYn[[k]])) (1/(z - alphaW2n[[2 k - 1]]) -
        derivadassegundasalphaW2n[[2 k - 1]]/
          (2 derivadasalphaW2n[[2 k - 1]]) -
```

$$\left.\left.\left.\frac{\text{derivadassegundasalphaYn}[\![k]\!]}{2\,\text{derivadasalphaYn}[\![k]\!]}+\frac{3\,n}{2}\right)\right)\right);$$

```
SHerm[z_] =
 (Sum[(alphapwp[[2 k]] derivadasalphaZn[[k]] u[[2 k]])/
    ((z - alphaW2n[[2 k]]) (derivadasalphaW2n[[2 k]])^2) +
   (alphapwp[[2 k - 1]]/
     ((z - alphaW2n[[2 k - 1]]) derivadasalphaW2n[[2 k - 1]] *
       derivadasalphaYn[[k]])) (1/(z - alphaW2n[[2 k - 1]]) -
     derivadassegundasalphaW2n[[2 k - 1]]/
      (2 derivadasalphaW2n[[2 k - 1]]) -
     derivadassegundasalphaYn[[k]]/(2 derivadasalphaYn[[k]]) +
     3 n/2) u[[2 k - 1]], {k, 1, n}] +
  Sum[((alphapwp[[2 k - 1]]/((z - alphaW2n[[2 k - 1]])
        derivadasalphaW2n[[2 k - 1]] derivadasalphaYn[[k]]))
     v[[2 k - 1]]), {k, 1, n/5}] + Sum[((alphapwp[[2 k - 1]]/
     ((z - alphaW2n[[2 k - 1]]) derivadasalphaW2n[[2 k - 1]] *
       derivadasalphaYn[[k]])) v[[2 k - 1]]), {k, 4 n/5, n}])/
 (Sum[(alphapwp[[2 k]] derivadasalphaZn[[k]])/
    ((z - alphaW2n[[2 k]]) (derivadasalphaW2n[[2 k]])^2) +
   (alphapwp[[2 k - 1]]/
     ((z - alphaW2n[[2 k - 1]]) derivadasalphaW2n[[2 k - 1]] *
       derivadasalphaYn[[k]])) (1/(z - alphaW2n[[2 k - 1]]) -
     derivadassegundasalphaW2n[[2 k - 1]]/
      (2 derivadasalphaW2n[[2 k - 1]]) -
     derivadassegundasalphaYn[[k]]/(2 derivadasalphaYn[[k]]) +
     3 n/2), {k, 1, n}]);
```

```
BB = Plot[{Re[SHerm[E^(I x)]], Re[ftest[E^(I x)]]},
  {x, 0, Pi / 2 + .3}, PlotRange → Full, PlotPoints → 100,
  PlotStyle → {{Red, Thickness[.001]},
    {Black, Thickness[.001]}}, AspectRatio → 5 / 7];
BB1 = Plot[{Re[SHFejer[E^(I x)]], Re[ftest[E^(I x)]]},
  {x, Pi / 2 - 0.3, Pi / 2 + .3}, PlotRange → Full,
  PlotPoints → 200, PlotStyle → {{Red, Thickness[.001]},
    {Black, Thickness[.001]}}, AspectRatio → 5 / 7];

AA = Table[{Re[Log[alphaW2n[[k]]] / I],
   Re[ftest[alphaW2n[[k]]]]}, {k, 1, 2 n}];
AA = ListPlot[AA, PlotStyle → PointSize[.005]];
Show[BB, AA]
Show[BB1, AA]
```

Out[ ]=

```
/Users/eliasberriochoaesnaola
```

Out[ ]=

$$\frac{1}{2}\left(\frac{1}{z}+z\right)\text{Sin}\left[\frac{2}{\frac{1}{z}+z}\right]$$

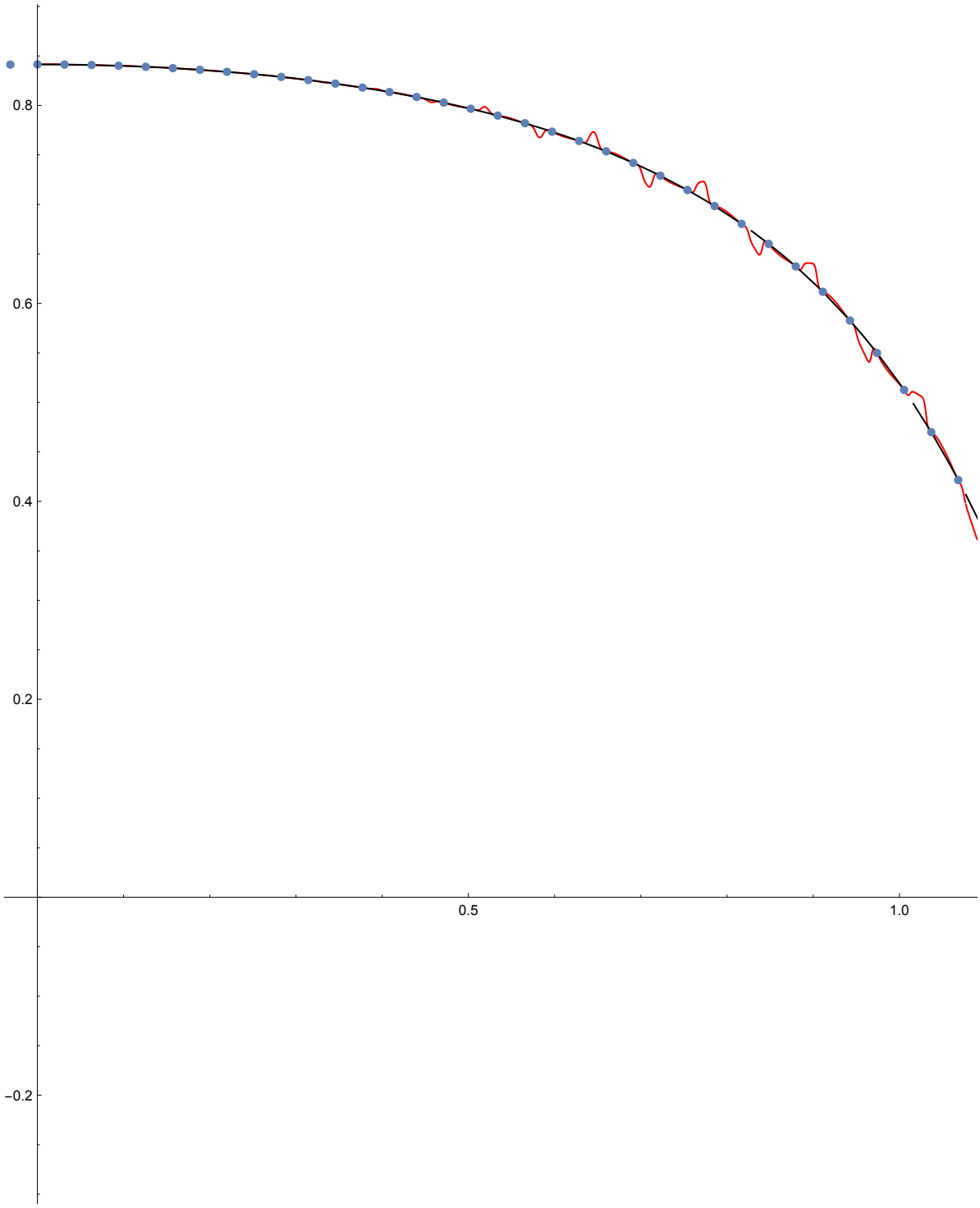
Out[ ]=

```
Interval[{-∞, ∞}]
```

Out[ ]=

```
{Listable}
```

Out[ ]=



Out[ ]=