In[4253]:=
```
(*Replacement of trigonometric function,nc=20,even*)
Table[Sin[m * Pi / 2] ^ 20, {m, -20, 20}]
Table[(1 - (-1) ^ m) / 2, {m, -20, 20}]
```

Out[4253]=
```
{0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0,
 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0}
```

Out[4254]=
```
{0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0,
 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0}
```

In[4255]:=
```
(*Replacement of trigonometric function,nc=23,odd*)
Table[Sin[m * Pi / 2] ^ 23, {m, -20, 20}]
Table[(- (-I) ^ (m + 1) - I ^ (m + 1)) / 2, {m, -20, 20}]
```

Out[4255]=
```
{0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0,
 -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0}
```

Out[4256]=
```
{0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0,
 -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0, -1, 0, 1, 0}
```

```
(*This document is used to verify the correctness of
   the trigonometric function approximation at t=pi/8 or 3pi/8.*)
 (*For n_c>n_d,and even both; ie.nc=24,nd=14*)

ll = Table[Sin[m * Pi / 4] ^ 24 * Cos[m * Pi / 4] ^ 14.0, {m, -20, 20}]
Table[(Sqrt[2] / 2) ^ 10 / 2.0^14 * (1 - (-1) ^ m) / 2, {m, -20, 20}]
```

Out[4259]=
```
{0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.}
```

Out[4260]=
```
{0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.,
 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0., 1.90735×10^-6, 0.}
```

In[4261]:=
```
(*For (n_c>n_d,and odd both; ie.nc=23,nd=5)*)
ll = Table[Sin[m * Pi / 4]^23 * Cos[m * Pi / 4]^5.0, {m, -20, 20}]
     表格  正弦  圆周率  余弦  圆周率
Table[(Sqrt[2] / 2)^18 / (2^6.0) * (-I^(m + 1) - (-I)^(m + 1)), {m, -20, 20}]
表格  平方根  虚数单位  虚数单位
```

Out[4261]=
```
{0., 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.}
```

Out[4262]=
```
{0., 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.,
 0.0000610352, 0., -0.0000610352, 0., 0.0000610352, 0., -0.0000610352, 0.}
```

```
(*For (n_c<n_d,and even both; ie.nc=6,nd=20)*)
ll = Table[Sin[m * Pi / 4]^6 * Cos[m * Pi / 4]^20.0, {m, -20, 20}]
     表格  正弦  圆周率  余弦  圆周率
Table[(Sqrt[2] / 2)^(14) / 2.^7 * (1 - (-1)^m), {m, -20, 20}]
表格  平方根
```

Out[4265]=
```
{0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.,
 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.,
 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.,
 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.}
```

Out[4266]=
```
{0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.,
 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.,
 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.,
 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0., 0.00012207, 0.}
```

In[4267]:=
```
(*For (n_c<n_d,and odd both; ie.nc=7,nd=25)*)
ll = Table[Sin[m * Pi / 4]^7 * Cos[m * Pi / 4]^25.0, {m, -20, 20}]
     表格  正弦  圆周率  余弦  圆周率
Table[(Sqrt[2] / 2)^(18) / 2.^8 * (-I^(m + 1) - (-I)^(m + 1)), {m, -20, 20}]
表格  平方根  虚数单位  虚数单位
```

Out[4267]=
```
{0., 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.}
```

Out[4268]=
```
{0., 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.,
 0.0000152588, 0., -0.0000152588, 0., 0.0000152588, 0., -0.0000152588, 0.}
```