In[ ]:= **σ = 4 / 5**

```
(*simulator_extended_stabilizer*)
ZeroZeroFirst10simulatorextendedstabilizer = 2125
ZeroOneFirst10simulatorextendedstabilizer = 1663
OneZeroFirst10simulatorextendedstabilizer = 4402
OneOneFirst10simulatorextendedstabilizer = 2

ZeroZeroFirst08simulatorextendedstabilizer = 2039
ZeroOneFirst08simulatorextendedstabilizer = 1987
OneZeroFirst08simulatorextendedstabilizer = 4045
OneOneFirst08simulatorextendedstabilizer = 121

ZeroZeroFirst06simulatorextendedstabilizer = 1612
ZeroOneFirst06simulatorextendedstabilizer = 3042
OneZeroFirst06simulatorextendedstabilizer = 3053
OneOneFirst06simulatorextendedstabilizer = 485

ZeroZeroFirst04simulatorextendedstabilizer = 1149
ZeroOneFirst04simulatorextendedstabilizer = 4475
OneZeroFirst04simulatorextendedstabilizer = 1725
OneOneFirst04simulatorextendedstabilizer = 843

ZeroZeroFirst02simulatorextendedstabilizer = 851
ZeroOneFirst02simulatorextendedstabilizer = 5403
OneZeroFirst02simulatorextendedstabilizer = 681
OneOneFirst02simulatorextendedstabilizer = 1257

ZeroZeroFirst00simulatorextendedstabilizer = 698
ZeroOneFirst00simulatorextendedstabilizer = 5855
OneZeroFirst00simulatorextendedstabilizer = 249
OneOneFirst00simulatorextendedstabilizer = 1390

ZeroZeroSecond02simulatorextendedstabilizer = 900
ZeroOneSecond02simulatorextendedstabilizer = 5361
OneZeroSecond02simulatorextendedstabilizer = 678
OneOneSecond02simulatorextendedstabilizer = 1253

ZeroZeroSecond04simulatorextendedstabilizer = 1233
ZeroOneSecond04simulatorextendedstabilizer = 4366
OneZeroSecond04simulatorextendedstabilizer = 1704
OneOneSecond04simulatorextendedstabilizer = 889

ZeroZeroSecond06simulatorextendedstabilizer = 1605
ZeroOneSecond06simulatorextendedstabilizer = 3067
OneZeroSecond06simulatorextendedstabilizer = 3059
OneOneSecond06simulatorextendedstabilizer = 461

ZeroZeroSecond08simulatorextendedstabilizer = 2019
ZeroOneSecond08simulatorextendedstabilizer = 2009
OneZeroSecond08simulatorextendedstabilizer = 4027
```

```
OneOneSecond08simulatorextendedstabilizer = 137

ZeroZeroSecond10simulatorextendedstabilizer = 2125
ZeroOneSecond10simulatorextendedstabilizer = 1663
OneZeroSecond10simulatorextendedstabilizer = 4402
OneOneSecond10simulatorextendedstabilizer = 2

CosSqsimulatorextendedstabilizer = {{-1 * π, ZeroZeroSecond10simulatorextendedstabilizer /
      (OneZeroSecond10simulatorextendedstabilizer +
        ZeroZeroSecond10simulatorextendedstabilizer)},
   {-0.8 * π, ZeroZeroSecond08simulatorextendedstabilizer /
      (OneZeroSecond08simulatorextendedstabilizer +
        ZeroZeroSecond08simulatorextendedstabilizer)},
   {-0.6 * π, ZeroZeroSecond06simulatorextendedstabilizer /
      (OneZeroSecond06simulatorextendedstabilizer +
        ZeroZeroSecond06simulatorextendedstabilizer)},
   {-0.4 * π, ZeroZeroSecond04simulatorextendedstabilizer /
      (OneZeroSecond04simulatorextendedstabilizer +
        ZeroZeroSecond04simulatorextendedstabilizer)},
   {-0.2 * π, ZeroZeroSecond02simulatorextendedstabilizer /
      (OneZeroSecond02simulatorextendedstabilizer +
        ZeroZeroSecond02simulatorextendedstabilizer)},
   {0.0 * π, ZeroZeroFirst00simulatorextendedstabilizer /
      (OneZeroFirst00simulatorextendedstabilizer +
        ZeroZeroFirst00simulatorextendedstabilizer)},
   {0.2 * π, ZeroZeroFirst02simulatorextendedstabilizer /
      (OneZeroFirst02simulatorextendedstabilizer +
        ZeroZeroFirst02simulatorextendedstabilizer)},
   {0.4 * π, ZeroZeroFirst04simulatorextendedstabilizer /
      (OneZeroFirst04simulatorextendedstabilizer +
        ZeroZeroFirst04simulatorextendedstabilizer)},
   {0.6 * π, ZeroZeroFirst06simulatorextendedstabilizer /
      (OneZeroFirst06simulatorextendedstabilizer +
        ZeroZeroFirst06simulatorextendedstabilizer)},
   {0.8 * π, ZeroZeroFirst08simulatorextendedstabilizer /
      (OneZeroFirst08simulatorextendedstabilizer +
        ZeroZeroFirst08simulatorextendedstabilizer)},
   {1 * π, ZeroZeroFirst10simulatorextendedstabilizer /
      (OneZeroFirst10simulatorextendedstabilizer +
        ZeroZeroFirst10simulatorextendedstabilizer)}}
Decisivenesssimulatorextendedstabilizer =
  {{-1 * π, (OneZeroSecond10simulatorextendedstabilizer +
        ZeroZeroSecond10simulatorextendedstabilizer) / 8192},
   {-0.8 * π, (OneZeroSecond08simulatorextendedstabilizer +
        ZeroZeroSecond08simulatorextendedstabilizer) / 8192},
   {-0.6 * π, (OneZeroSecond06simulatorextendedstabilizer +
        ZeroZeroSecond06simulatorextendedstabilizer) / 8192},
```

```
{-0.4 * π, (OneZeroSecond04simulatorextendedstabilizer +
      ZeroZeroSecond04simulatorextendedstabilizer) / 8192},
{-0.2 * π, (OneZeroSecond02simulatorextendedstabilizer +
      ZeroZeroSecond02simulatorextendedstabilizer) / 8192},
{-0.0 * π, (OneZeroFirst00simulatorextendedstabilizer +
      ZeroZeroFirst00simulatorextendedstabilizer) / 8192},
{0.2 * π, (OneZeroFirst02simulatorextendedstabilizer +
      ZeroZeroFirst02simulatorextendedstabilizer) / 8192},
{0.4 * π, (OneZeroFirst04simulatorextendedstabilizer +
      ZeroZeroFirst04simulatorextendedstabilizer) / 8192},
{0.6 * π, (OneZeroFirst06simulatorextendedstabilizer +
      ZeroZeroFirst06simulatorextendedstabilizer) / 8192},
{0.8 * π, (OneZeroFirst08simulatorextendedstabilizer +
      ZeroZeroFirst08simulatorextendedstabilizer) / 8192},
{1.0 * π, (OneZeroFirst10simulatorextendedstabilizer +
      ZeroZeroFirst10simulatorextendedstabilizer) / 8192}}
ExpCosSqsimulatorextendedstabilizer = ListPlot[CosSqsimulatorextendedstabilizer]
ExpDecisivenesssimulatorextendedstabilizer =
  ListPlot[Decisivenesssimulatorextendedstabilizer]
```

Out[●]= $\frac{4}{5}$

Out[●]= 2125

Out[●]= 1663

Out[●]= 4402

Out[●]= 2

Out[●]= 2039

Out[●]= 1987

Out[●]= 4045

Out[●]= 121

Out[●]= 1612

Out[●]= 3042

Out[●]= 3053

Out[●]= 485

Out[●]= 1149

Out[●]= 4475

Out[●]= 1725

Out[●]= 843

Out[●]= 851

Out[●]= 5403

Out[●]= 681

Out[●]= 1257

Out[●]= 698

Out[●]= 5855

Out[●]= 249

Out[●]= 1390

Out[●]= 900

Out[●]= 5361

Out[●]= 678

Out[●]= 1253

Out[●]= 1233

Out[●]= 4366

Out[●]= 1704

Out[●]= 889

Out[●]= 1605

Out[●]= 3067

Out[●]= 3059

Out[●]= 461

Out[●]= 2019

Out[●]= 2009

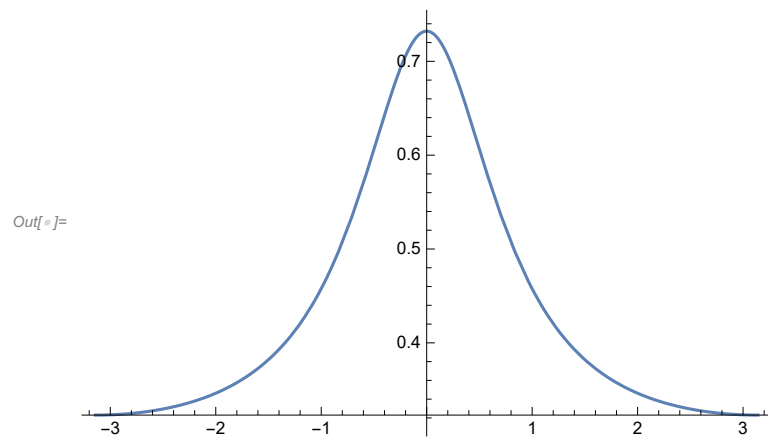Out[●]= 4027

Out[●]= 137

Out[●]= 2125

Out[●]= 1663

Out[●]= 4402

Out[●]= 2

Out[●]= $\left\{\left\{-\pi, \frac{2125}{6527}\right\}, \left\{-2.51327, \frac{2019}{6046}\right\}, \left\{-1.88496, \frac{1605}{4664}\right\},\right.$
$\left\{-1.25664, \frac{411}{979}\right\}, \left\{-0.628319, \frac{150}{263}\right\}, \left\{0., \frac{698}{947}\right\}, \left\{0.628319, \frac{851}{1532}\right\},$
$\left.\left\{1.25664, \frac{383}{958}\right\}, \left\{1.88496, \frac{1612}{4665}\right\}, \left\{2.51327, \frac{2039}{6084}\right\}, \left\{\pi, \frac{2125}{6527}\right\}\right\}$
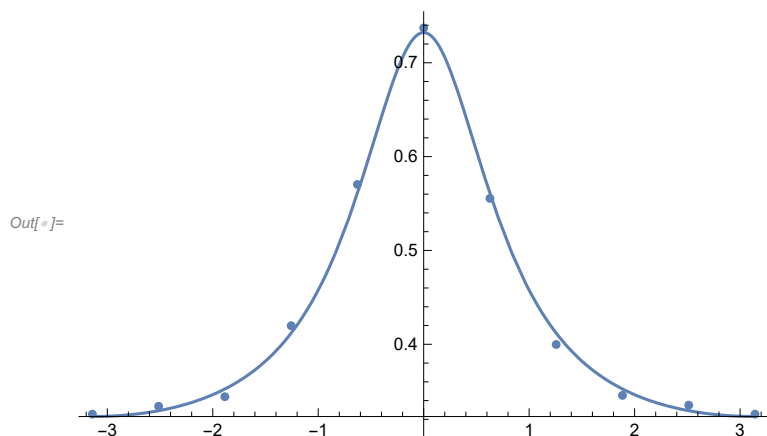
Out[ ]= $\left\{\left\{-\pi, \frac{6527}{8192}\right\}, \left\{-2.51327, \frac{3023}{4096}\right\}, \left\{-1.88496, \frac{583}{1024}\right\},\right.$

$\left\{-1.25664, \frac{2937}{8192}\right\}, \left\{-0.628319, \frac{789}{4096}\right\}, \left\{0., \frac{947}{8192}\right\}, \left\{0.628319, \frac{383}{2048}\right\},$

$\left.\left\{1.25664, \frac{1437}{4096}\right\}, \left\{1.88496, \frac{4665}{8192}\right\}, \left\{2.51327, \frac{1521}{2048}\right\}, \left\{3.14159, \frac{6527}{8192}\right\}\right\}$

Out[ ]=

Out[ ]=
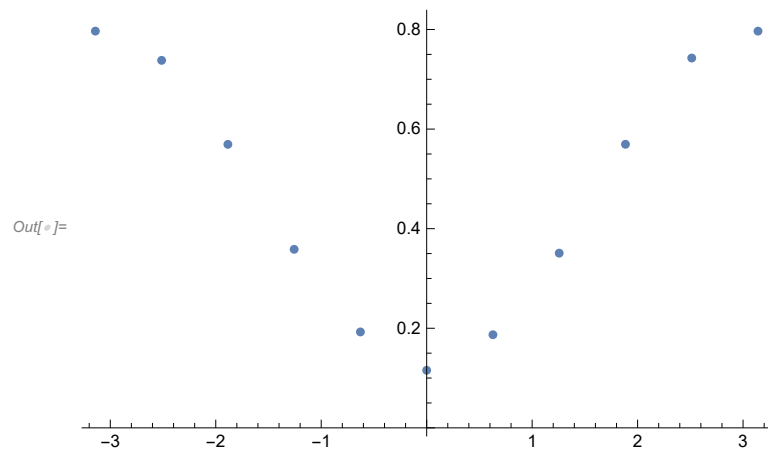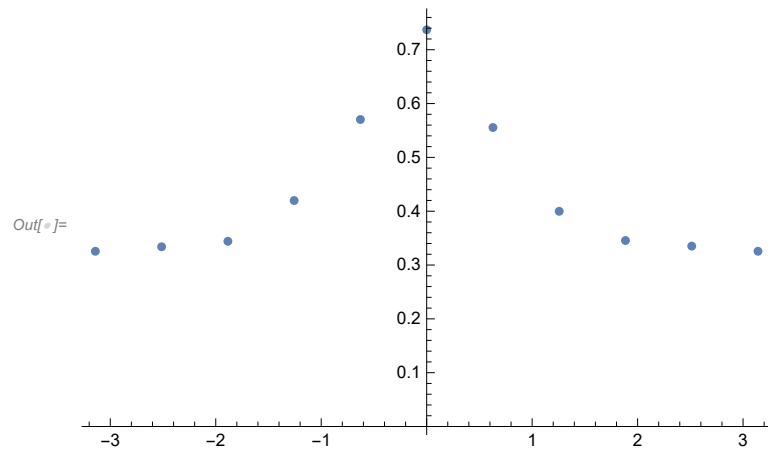
In[ ]:= **cosTH = Plot$\left[1 - N\left[cosSecondFunction\left[-x, 4/5, \pi/2 - 1, 1\right]\right], \{x, -\pi, \pi\}\right]$**
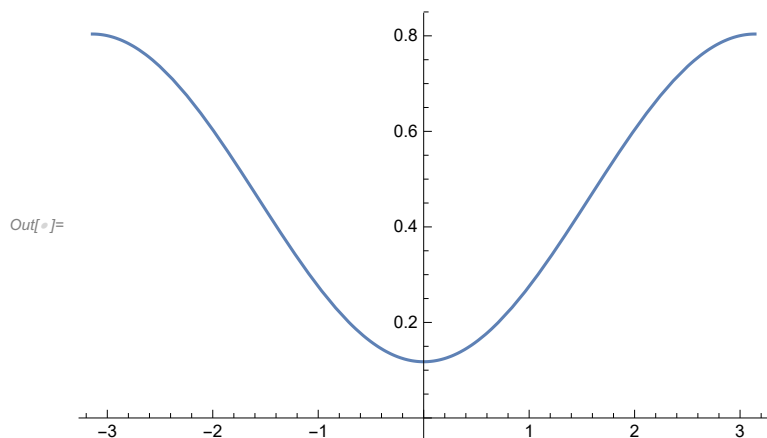
Out[ ]=

In[ ]:= **Show[cosTH, ExpCosSqsimulatorextendedstabilizer]**

Out[ ]=

In[ ]:=

In[ ]:= **decTH = Plot[DecisivenessSecondFunction[-x, 4 / 5, π / 2 - 1, 3], {x, -π, π}]**

Out[ ]=

In[ ]:= **Show[decTH, ExpDecisivenesssimulatorextendedstabilizer]**

Out[ ]=
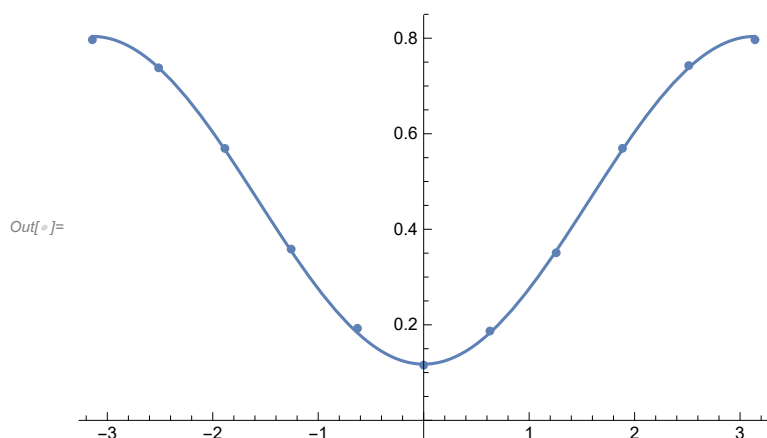
In[ ]:= **(*simulator_mps*)**
ZeroZeroFirst10simulatormps = 2125
ZeroOneFirst10simulatormps = 1602
OneZeroFirst10simulatormps = 4464

```
OneOneFirst10simulatormps = 1

ZeroZeroFirst08simulatormps = 1987
ZeroOneFirst08simulatormps = 2022
OneZeroFirst08simulatormps = 4065
OneOneFirst08simulatormps = 118

ZeroZeroFirst06simulatormps = 1625
ZeroOneFirst06simulatormps = 3068
OneZeroFirst06simulatormps = 3053
OneOneFirst06simulatormps = 446

ZeroZeroFirst04simulatormps = 1248
ZeroOneFirst04simulatormps = 4356
OneZeroFirst04simulatormps = 1723
OneOneFirst04simulatormps = 865

ZeroZeroFirst02simulatormps = 810
ZeroOneFirst02simulatormps = 5436
OneZeroFirst02simulatormps = 662
OneOneFirst02simulatormps = 1284

ZeroZeroFirst00simulatormps = 690
ZeroOneFirst00simulatormps = 5867
OneZeroFirst00simulatormps = 267
OneOneFirst00simulatormps = 1368

ZeroZeroSecond02simulatormps = 854
ZeroOneSecond02simulatormps = 5509
OneZeroSecond02simulatormps = 638
OneOneSecond02simulatormps = 1191

ZeroZeroSecond04simulatormps = 1189
ZeroOneSecond04simulatormps = 4390
OneZeroSecond04simulatormps = 1709
OneOneSecond04simulatormps = 904

ZeroZeroSecond06simulatormps = 1599
ZeroOneSecond06simulatormps = 3146
OneZeroSecond06simulatormps = 2962
OneOneSecond06simulatormps = 485

ZeroZeroSecond08simulatormps = 2018
ZeroOneSecond08simulatormps = 2008
OneZeroSecond08simulatormps = 4037
OneOneSecond08simulatormps = 129

ZeroZeroSecond10simulatormps = 2125
ZeroOneSecond10simulatormps = 1602
OneZeroSecond10simulatormps = 4464
OneOneSecond10simulatormps = 1
```

```
CosSqsimulatormps = {{-1 * π, ZeroZeroSecond10simulatormps /
      (OneZeroSecond10simulatormps + ZeroZeroSecond10simulatormps)},
   {-0.8 * π, ZeroZeroSecond08simulatormps /
      (OneZeroSecond08simulatormps + ZeroZeroSecond08simulatormps)},
   {-0.6 * π, ZeroZeroSecond06simulatormps /
      (OneZeroSecond06simulatormps + ZeroZeroSecond06simulatormps)},
   {-0.4 * π, ZeroZeroSecond04simulatormps /
      (OneZeroSecond04simulatormps + ZeroZeroSecond04simulatormps)},
   {-0.2 * π, ZeroZeroSecond02simulatormps /
      (OneZeroSecond02simulatormps + ZeroZeroSecond02simulatormps)},
   {0.0 * π, ZeroZeroFirst00simulatormps / (OneZeroFirst00simulatormps +
       ZeroZeroFirst00simulatormps)}, {0.2 * π, ZeroZeroFirst02simulatormps /
      (OneZeroFirst02simulatormps + ZeroZeroFirst02simulatormps)},
   {0.4 * π, ZeroZeroFirst04simulatormps / (OneZeroFirst04simulatormps +
       ZeroZeroFirst04simulatormps)}, {0.6 * π, ZeroZeroFirst06simulatormps /
      (OneZeroFirst06simulatormps + ZeroZeroFirst06simulatormps)},
   {0.8 * π, ZeroZeroFirst08simulatormps / (OneZeroFirst08simulatormps +
       ZeroZeroFirst08simulatormps)}, {1 * π, ZeroZeroFirst10simulatormps /
      (OneZeroFirst10simulatormps + ZeroZeroFirst10simulatormps)}}
Decisivenesssimulatormps = {{-1 * π,
    (OneZeroSecond10simulatormps + ZeroZeroSecond10simulatormps) / 8192},
   {-0.8 * π, (OneZeroSecond08simulatormps + ZeroZeroSecond08simulatormps) / 8192},
   {-0.6 * π, (OneZeroSecond06simulatormps + ZeroZeroSecond06simulatormps) / 8192},
   {-0.4 * π, (OneZeroSecond04simulatormps + ZeroZeroSecond04simulatormps) / 8192},
   {-0.2 * π, (OneZeroSecond02simulatormps + ZeroZeroSecond02simulatormps) / 8192},
   {-0.0 * π, (OneZeroFirst00simulatormps + ZeroZeroFirst00simulatormps) / 8192},
   {0.2 * π, (OneZeroFirst02simulatormps + ZeroZeroFirst02simulatormps) / 8192},
   {0.4 * π, (OneZeroFirst04simulatormps + ZeroZeroFirst04simulatormps) / 8192},
   {0.6 * π, (OneZeroFirst06simulatormps + ZeroZeroFirst06simulatormps) / 8192},
   {0.8 * π, (OneZeroFirst08simulatormps + ZeroZeroFirst08simulatormps) / 8192},
   {1.0 * π, (OneZeroFirst10simulatormps + ZeroZeroFirst10simulatormps) / 8192}}
ExpCosSqsimulatormps = ListPlot[CosSqsimulatormps]
ExpDecisivenesssimulatormps = ListPlot[Decisivenesssimulatormps]
```

Out[ ]= 2125

Out[ ]= 1602

Out[ ]= 4464

Out[ ]= 1

Out[ ]= 1987

Out[ ]= 2022

Out[ ]= 4065

Out[ ]= 118

Out[ ]= 1625

Out[ ]= 3068

Out[ ]= 3053

Out[ ]= 446

Out[ ]= 1248

Out[ ]= 4356

Out[ ]= 1723

Out[ ]= 865

Out[ ]= 810

Out[ ]= 5436

Out[ ]= 662

Out[ ]= 1284

Out[ ]= 690

Out[ ]= 5867

Out[ ]= 267

Out[ ]= 1368

Out[ ]= 854

Out[ ]= 5509

Out[ ]= 638

Out[ ]= 1191

Out[ ]= 1189

Out[ ]= 4390

Out[ ]= 1709

Out[ ]= 904

Out[ ]= 1599

Out[ ]= 3146

Out[ ]= 2962

Out[ ]= 485

Out[ ]= 2018

Out[ ]= 2008

Out[ ]= 4037

Out[ ]= 129

*Out[ ]=* 2125

Out[ ]= 1602

Out[ ]= 4464

Out[ ]= 1

Out[ ]= $\left\{\left\{-\pi, \dfrac{2125}{6589}\right\}, \left\{-2.51327, \dfrac{2018}{6055}\right\}, \left\{-1.88496, \dfrac{1599}{4561}\right\},\right.$
$\left\{-1.25664, \dfrac{1189}{2898}\right\}, \left\{-0.628319, \dfrac{427}{746}\right\}, \left\{0., \dfrac{230}{319}\right\}, \left\{0.628319, \dfrac{405}{736}\right\},$
$\left\{1.25664, \dfrac{1248}{2971}\right\}, \left\{1.88496, \dfrac{1625}{4678}\right\}, \left\{2.51327, \dfrac{1987}{6052}\right\}, \left\{\pi, \dfrac{2125}{6589}\right\}\right\}$

Out[ ]= $\left\{\left\{-\pi, \dfrac{6589}{8192}\right\}, \left\{-2.51327, \dfrac{6055}{8192}\right\}, \left\{-1.88496, \dfrac{4561}{8192}\right\},\right.$
$\left\{-1.25664, \dfrac{1449}{4096}\right\}, \left\{-0.628319, \dfrac{373}{2048}\right\}, \left\{0., \dfrac{957}{8192}\right\}, \left\{0.628319, \dfrac{23}{128}\right\},$
$\left\{1.25664, \dfrac{2971}{8192}\right\}, \left\{1.88496, \dfrac{2339}{4096}\right\}, \left\{2.51327, \dfrac{1513}{2048}\right\}, \left\{3.14159, \dfrac{6589}{8192}\right\}\right\}$
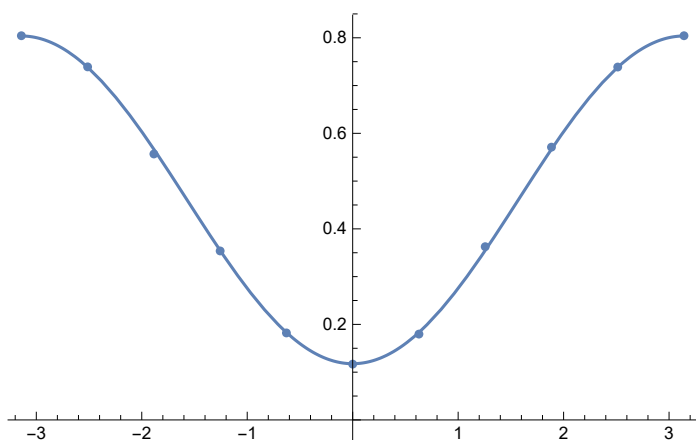
Out[ ]=

Out[ ]=
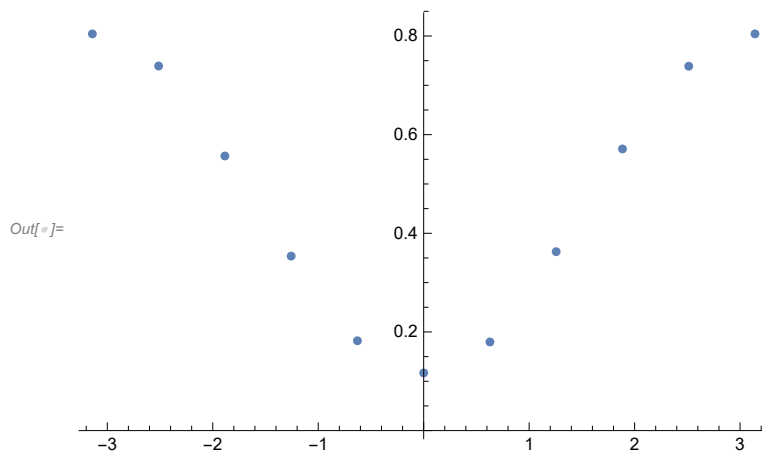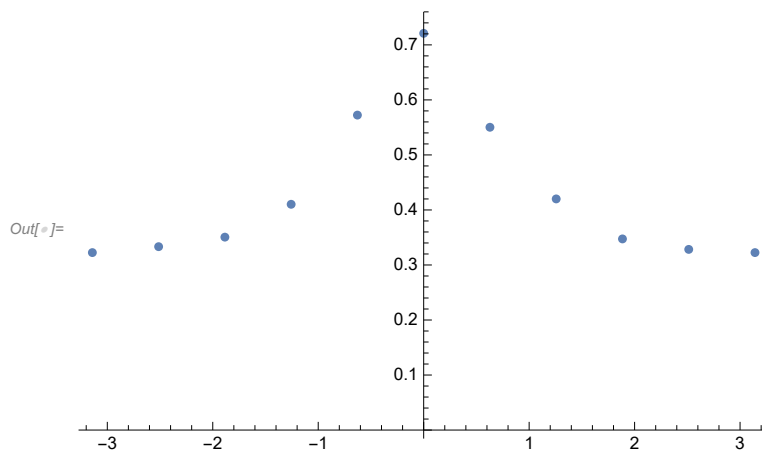
In[ ]:= **Show[cosTH, ExpCosSqsimulatormps]**

Out[ ]=
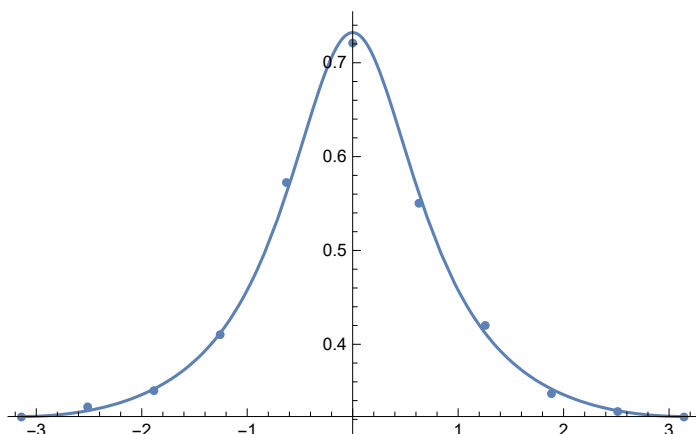
In[ ]:= **Show[decTH, ExpDecisivenesssimulatormps]**

Out[ ]=

In[ ]:= **(*simulator_statevector*)**
ZeroZeroFirst10simulatorstatevector = 2073
ZeroOneFirst10simulatorstatevector = 1655
OneZeroFirst10simulatorstatevector = 4464
OneOneFirst10simulatorstatevector = 0

ZeroZeroFirst08simulatorstatevector = 1974
ZeroOneFirst08simulatorstatevector = 2032
OneZeroFirst08simulatorstatevector = 4054
OneOneFirst08simulatorstatevector = 132

ZeroZeroFirst06simulatorstatevector = 1560
ZeroOneFirst06simulatorstatevector = 3147
OneZeroFirst06simulatorstatevector = 3031
OneOneFirst06simulatorstatevector = 454

ZeroZeroFirst04simulatorstatevector = 1167
ZeroOneFirst04simulatorstatevector = 4476
OneZeroFirst04simulatorstatevector = 1681
OneOneFirst04simulatorstatevector = 868

```
ZeroZeroFirst02simulatorstatevector = 855
ZeroOneFirst02simulatorstatevector = 5376
OneZeroFirst02simulatorstatevector = 665
OneOneFirst02simulatorstatevector = 1296

ZeroZeroFirst00simulatorstatevector = 740
ZeroOneFirst00simulatorstatevector = 5819
OneZeroFirst00simulatorstatevector = 274
OneOneFirst00simulatorstatevector = 1359

ZeroZeroSecond02simulatorstatevector = 809
ZeroOneSecond02simulatorstatevector = 5470
OneZeroSecond02simulatorstatevector = 677
OneOneSecond02simulatorstatevector = 1236

ZeroZeroSecond04simulatorstatevector = 1240
ZeroOneSecond04simulatorstatevector = 4294
OneZeroSecond04simulatorstatevector = 1723
OneOneSecond04simulatorstatevector = 935

ZeroZeroSecond06simulatorstatevector = 1671
ZeroOneSecond06simulatorstatevector = 2997
OneZeroSecond06simulatorstatevector = 3037
OneOneSecond06simulatorstatevector = 487

ZeroZeroSecond08simulatorstatevector = 2062
ZeroOneSecond08simulatorstatevector = 2000
OneZeroSecond08simulatorstatevector = 3986
OneOneSecond08simulatorstatevector = 144

ZeroZeroSecond10simulatorstatevector = 2073
ZeroOneSecond10simulatorstatevector = 1655
OneZeroSecond10simulatorstatevector = 4464
OneOneSecond10simulatorstatevector = 0

CosSqsimulatorstatevector = {{-1 * π, ZeroZeroSecond10simulatorstatevector /
    (OneZeroSecond10simulatorstatevector + ZeroZeroSecond10simulatorstatevector)},
  {-0.8 * π, ZeroZeroSecond08simulatorstatevector /
    (OneZeroSecond08simulatorstatevector + ZeroZeroSecond08simulatorstatevector)},
  {-0.6 * π, ZeroZeroSecond06simulatorstatevector /
    (OneZeroSecond06simulatorstatevector + ZeroZeroSecond06simulatorstatevector)},
  {-0.4 * π, ZeroZeroSecond04simulatorstatevector /
    (OneZeroSecond04simulatorstatevector + ZeroZeroSecond04simulatorstatevector)},
  {-0.2 * π, ZeroZeroSecond02simulatorstatevector /
    (OneZeroSecond02simulatorstatevector + ZeroZeroSecond02simulatorstatevector)},
  {0.0 * π, ZeroZeroFirst00simulatorstatevector /
    (OneZeroFirst00simulatorstatevector + ZeroZeroFirst00simulatorstatevector)},
  {0.2 * π, ZeroZeroFirst02simulatorstatevector /
    (OneZeroFirst02simulatorstatevector + ZeroZeroFirst02simulatorstatevector)},
  {0.4 * π, ZeroZeroFirst04simulatorstatevector /
```

```
          (OneZeroFirst04simulatorstatevector + ZeroZeroFirst04simulatorstatevector)},
        {0.6 * π, ZeroZeroFirst06simulatorstatevector /
          (OneZeroFirst06simulatorstatevector + ZeroZeroFirst06simulatorstatevector)},
        {0.8 * π, ZeroZeroFirst08simulatorstatevector /
          (OneZeroFirst08simulatorstatevector + ZeroZeroFirst08simulatorstatevector)},
        {1 * π, ZeroZeroFirst10simulatorstatevector /
          (OneZeroFirst10simulatorstatevector + ZeroZeroFirst10simulatorstatevector)}}
    Decisivenesssimulatorstatevector = {{-1 * π,
        (OneZeroSecond10simulatorstatevector + ZeroZeroSecond10simulatorstatevector) / 8192},
      {-0.8 * π, (OneZeroSecond08simulatorstatevector + ZeroZeroSecond08simulatorstatevector) /
        8192}, {-0.6 * π,
        (OneZeroSecond06simulatorstatevector + ZeroZeroSecond06simulatorstatevector) / 8192},
      {-0.4 * π, (OneZeroSecond04simulatorstatevector + ZeroZeroSecond04simulatorstatevector) /
        8192}, {-0.2 * π,
        (OneZeroSecond02simulatorstatevector + ZeroZeroSecond02simulatorstatevector) / 8192},
      {-0.0 * π, (OneZeroFirst00simulatorstatevector + ZeroZeroFirst00simulatorstatevector) /
        8192}, {0.2 * π,
        (OneZeroFirst02simulatorstatevector + ZeroZeroFirst02simulatorstatevector) / 8192},
      {0.4 * π, (OneZeroFirst04simulatorstatevector + ZeroZeroFirst04simulatorstatevector) /
        8192}, {0.6 * π,
        (OneZeroFirst06simulatorstatevector + ZeroZeroFirst06simulatorstatevector) / 8192},
      {0.8 * π, (OneZeroFirst08simulatorstatevector + ZeroZeroFirst08simulatorstatevector) /
        8192}, {1.0 * π,
        (OneZeroFirst10simulatorstatevector + ZeroZeroFirst10simulatorstatevector) / 8192}}
    ExpCosSqsimulatorstatevector = ListPlot[CosSqsimulatorstatevector]
    ExpDecisivenesssimulatorstatevector = ListPlot[Decisivenesssimulatorstatevector]
```

Out[ ]= 2073

Out[ ]= 1655

Out[ ]= 4464

Out[ ]= 0

Out[ ]= 1974

Out[ ]= 2032

Out[ ]= 4054

Out[ ]= 132

Out[ ]= 1560

Out[ ]= 3147

Out[ ]= 3031

Out[ ]= 454

Out[ ]= 1167

Out[ ]= 4476

Out[ ]= 1681

Out[ ]= 868

Out[ ]= 855

Out[ ]= 5376

Out[ ]= 665

Out[ ]= 1296

Out[ ]= 740

Out[ ]= 5819

Out[ ]= 274

Out[ ]= 1359

Out[ ]= 809

Out[ ]= 5470

Out[ ]= 677

Out[ ]= 1236

Out[ ]= 1240

Out[ ]= 4294

Out[ ]= 1723

Out[ ]= 935

Out[ ]= 1671

Out[ ]= 2997

Out[ ]= 3037

Out[ ]= 487

Out[ ]= 2062

Out[ ]= 2000

Out[ ]= 3986

Out[ ]= 144

Out[ ]= 2073

Out[ ]= 1655

Out[ ]= 4464

Out[ ]= 0

Out[●]= $\left\{\left\{-\pi, \frac{691}{2179}\right\}, \left\{-2.51327, \frac{1031}{3024}\right\}, \left\{-1.88496, \frac{1671}{4708}\right\}, \left\{-1.25664, \frac{1240}{2963}\right\}, \left\{-0.628319, \frac{809}{1486}\right\},\right.$
$\left.\left\{0., \frac{370}{507}\right\}, \left\{0.628319, \frac{9}{16}\right\}, \left\{1.25664, \frac{1167}{2848}\right\}, \left\{1.88496, \frac{1560}{4591}\right\}, \left\{2.51327, \frac{987}{3014}\right\}, \left\{\pi, \frac{691}{2179}\right\}\right\}$

Out[●]= $\left\{\left\{-\pi, \frac{6537}{8192}\right\}, \left\{-2.51327, \frac{189}{256}\right\}, \left\{-1.88496, \frac{1177}{2048}\right\},\right.$
$\left\{-1.25664, \frac{2963}{8192}\right\}, \left\{-0.628319, \frac{743}{4096}\right\}, \left\{0., \frac{507}{4096}\right\}, \left\{0.628319, \frac{95}{512}\right\},$
$\left.\left\{1.25664, \frac{89}{256}\right\}, \left\{1.88496, \frac{4591}{8192}\right\}, \left\{2.51327, \frac{1507}{2048}\right\}, \left\{3.14159, \frac{6537}{8192}\right\}\right\}$
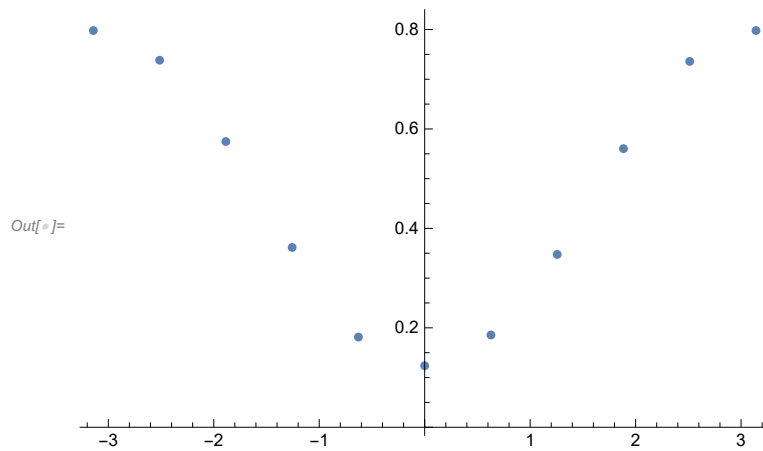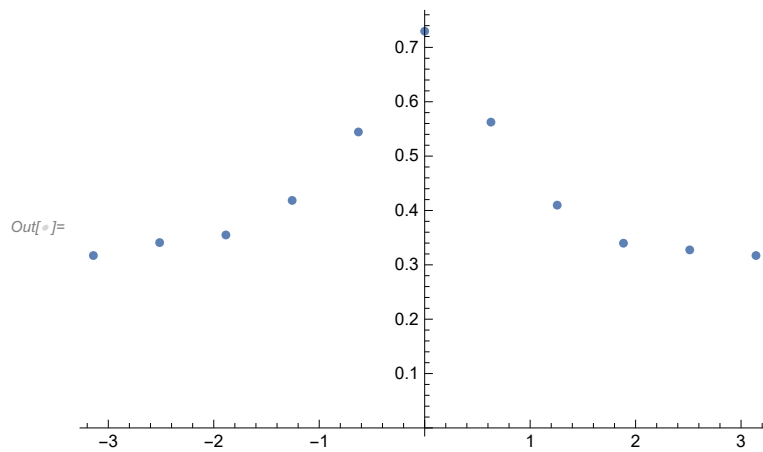
Out[●]=

In[ ]:= **Show[cosTH, ExpCosSqsimulatorstatevector]**

Out[ ]=

In[ ]:= **Show[decTH, ExpDecisivenesssimulatorstatevector]**

Out[ ]=
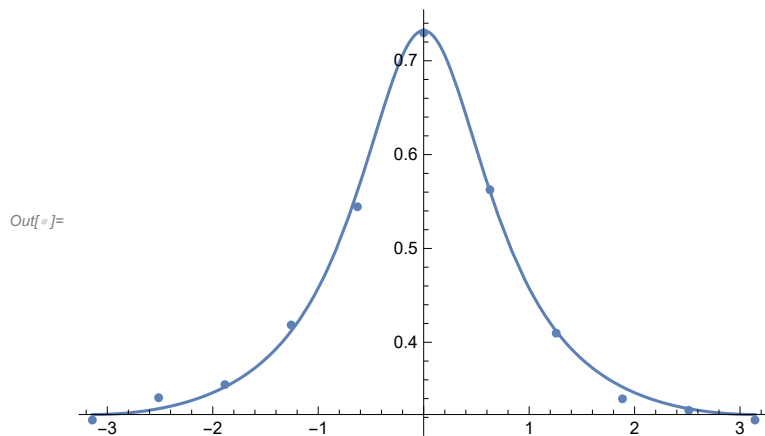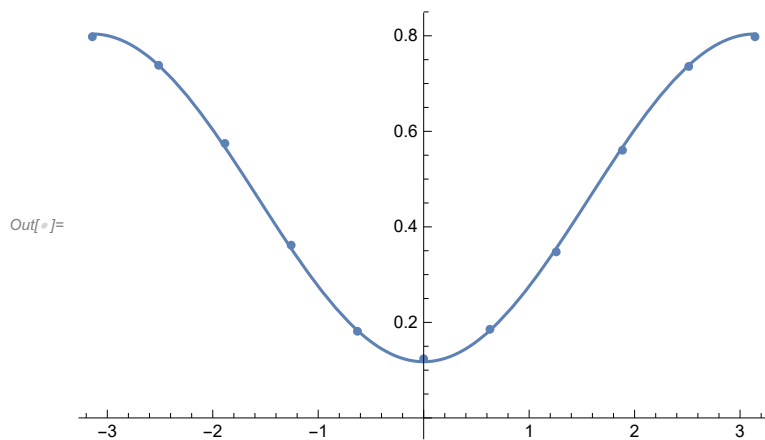
In[ ]:= **(∗ibm_nairobi∗)**
ZeroZeroFirst10ibmnairobi = 2132
ZeroOneFirst10ibmnairobi = 1322
OneZeroFirst10ibmnairobi = 4600
OneOneFirst10ibmnairobi = 138

ZeroZeroFirst08ibmnairobi = 2006
ZeroOneFirst08ibmnairobi = 1571
OneZeroFirst08ibmnairobi = 4447
OneOneFirst08ibmnairobi = 168

ZeroZeroFirst06ibmnairobi = 1755
ZeroOneFirst06ibmnairobi = 2582
OneZeroFirst06ibmnairobi = 3420
OneOneFirst06ibmnairobi = 435

ZeroZeroFirst04ibmnairobi = 1309
ZeroOneFirst04ibmnairobi = 3870
OneZeroFirst04ibmnairobi = 2104
OneOneFirst04ibmnairobi = 909

```
ZeroZeroFirst02ibmnairobi = 1046
ZeroOneFirst02ibmnairobi = 4896
OneZeroFirst02ibmnairobi = 924
OneOneFirst02ibmnairobi = 1326


ZeroZeroFirst00ibmnairobi = 949
ZeroOneFirst00ibmnairobi = 5302
OneZeroFirst00ibmnairobi = 394
OneOneFirst00ibmnairobi = 1547


ZeroZeroSecond02ibmnairobi = 1019
ZeroOneSecond02ibmnairobi = 5036
OneZeroSecond02ibmnairobi = 693
OneOneSecond02ibmnairobi = 1444


ZeroZeroSecond04ibmnairobi = 1310
ZeroOneSecond04ibmnairobi = 4056
OneZeroSecond04ibmnairobi = 1654
OneOneSecond04ibmnairobi = 1172


ZeroZeroSecond06ibmnairobi = 1618
ZeroOneSecond06ibmnairobi = 2845
OneZeroSecond06ibmnairobi = 2924
OneOneSecond06ibmnairobi = 805


ZeroZeroSecond08ibmnairobi = 1880
ZeroOneSecond08ibmnairobi = 1900
OneZeroSecond08ibmnairobi = 4043
OneOneSecond08ibmnairobi = 369


ZeroZeroSecond10ibmnairobi = 2132
ZeroOneSecond10ibmnairobi = 1322
OneZeroSecond10ibmnairobi = 4600
OneOneSecond10ibmnairobi = 138


CosSqibmnairobi = {{-1 * π,
   ZeroZeroSecond10ibmnairobi / (OneZeroSecond10ibmnairobi + ZeroZeroSecond10ibmnairobi)},
  {-0.8 * π, ZeroZeroSecond08ibmnairobi /
     (OneZeroSecond08ibmnairobi + ZeroZeroSecond08ibmnairobi)}, {-0.6 * π,
   ZeroZeroSecond06ibmnairobi / (OneZeroSecond06ibmnairobi + ZeroZeroSecond06ibmnairobi)},
  {-0.4 * π, ZeroZeroSecond04ibmnairobi /
     (OneZeroSecond04ibmnairobi + ZeroZeroSecond04ibmnairobi)}, {-0.2 * π,
   ZeroZeroSecond02ibmnairobi / (OneZeroSecond02ibmnairobi + ZeroZeroSecond02ibmnairobi)},
  {0.0 * π, ZeroZeroFirst00ibmnairobi /
     (OneZeroFirst00ibmnairobi + ZeroZeroFirst00ibmnairobi)}, {0.2 * π,
   ZeroZeroFirst02ibmnairobi / (OneZeroFirst02ibmnairobi + ZeroZeroFirst02ibmnairobi)},
  {0.4 * π, ZeroZeroFirst04ibmnairobi /
     (OneZeroFirst04ibmnairobi + ZeroZeroFirst04ibmnairobi)}, {0.6 * π,
   ZeroZeroFirst06ibmnairobi / (OneZeroFirst06ibmnairobi + ZeroZeroFirst06ibmnairobi)},
  {0.8 * π, ZeroZeroFirst08ibmnairobi /
```

```
            (OneZeroFirst08ibmnairobi + ZeroZeroFirst08ibmnairobi)}, {1 * π,
          ZeroZeroFirst10ibmnairobi / (OneZeroFirst10ibmnairobi + ZeroZeroFirst10ibmnairobi)}}
      Decisivenessibmnairobi = {{-1 * π, (OneZeroSecond10ibmnairobi + ZeroZeroSecond10ibmnairobi) /
           8192}, {-0.8 * π, (OneZeroSecond08ibmnairobi + ZeroZeroSecond08ibmnairobi) / 8192},
        {-0.6 * π, (OneZeroSecond06ibmnairobi + ZeroZeroSecond06ibmnairobi) / 8192},
        {-0.4 * π, (OneZeroSecond04ibmnairobi + ZeroZeroSecond04ibmnairobi) / 8192},
        {-0.2 * π, (OneZeroSecond02ibmnairobi + ZeroZeroSecond02ibmnairobi) / 8192},
        {-0.0 * π, (OneZeroFirst00ibmnairobi + ZeroZeroFirst00ibmnairobi) / 8192},
        {0.2 * π, (OneZeroFirst02ibmnairobi + ZeroZeroFirst02ibmnairobi) / 8192},
        {0.4 * π, (OneZeroFirst04ibmnairobi + ZeroZeroFirst04ibmnairobi) / 8192},
        {0.6 * π, (OneZeroFirst06ibmnairobi + ZeroZeroFirst06ibmnairobi) / 8192},
        {0.8 * π, (OneZeroFirst08ibmnairobi + ZeroZeroFirst08ibmnairobi) / 8192},
        {1.0 * π, (OneZeroFirst10ibmnairobi + ZeroZeroFirst10ibmnairobi) / 8192}}
      ExpCosSqibmnairobi = ListPlot[CosSqibmnairobi]
      ExpDecisivenessibmnairobi = ListPlot[Decisivenessibmnairobi]
```

Out[●]= 2132

Out[●]= 1322

Out[●]= 4600

Out[●]= 138

Out[●]= 2006

Out[●]= 1571

Out[●]= 4447

Out[●]= 168

Out[●]= 1755

Out[●]= 2582

Out[●]= 3420

Out[●]= 435

Out[●]= 1309

Out[●]= 3870

Out[●]= 2104

Out[●]= 909

Out[●]= 1046

Out[●]= 4896

Out[●]= 924

Out[●]= 1326

Out[●]= 949

Out[ ]= 5302

Out[ ]= 394

Out[ ]= 1547

Out[ ]= 1019

Out[ ]= 5036

Out[ ]= 693

Out[ ]= 1444

Out[ ]= 1310

Out[ ]= 4056

Out[ ]= 1654

Out[ ]= 1172

Out[ ]= 1618

Out[ ]= 2845

Out[ ]= 2924

Out[ ]= 805

Out[ ]= 1880

Out[ ]= 1900

Out[ ]= 4043

Out[ ]= 369

Out[ ]= 2132

Out[ ]= 1322

Out[ ]= 4600

Out[ ]= 138

Out[ ]= $\left\{\left\{-\pi, \frac{533}{1683}\right\}, \left\{-2.51327, \frac{1880}{5923}\right\}, \left\{-1.88496, \frac{809}{2271}\right\},\right.$
$\left\{-1.25664, \frac{655}{1482}\right\}, \left\{-0.628319, \frac{1019}{1712}\right\}, \left\{0., \frac{949}{1343}\right\}, \left\{0.628319, \frac{523}{985}\right\},$
$\left.\left\{1.25664, \frac{1309}{3413}\right\}, \left\{1.88496, \frac{39}{115}\right\}, \left\{2.51327, \frac{2006}{6453}\right\}, \left\{\pi, \frac{533}{1683}\right\}\right\}$
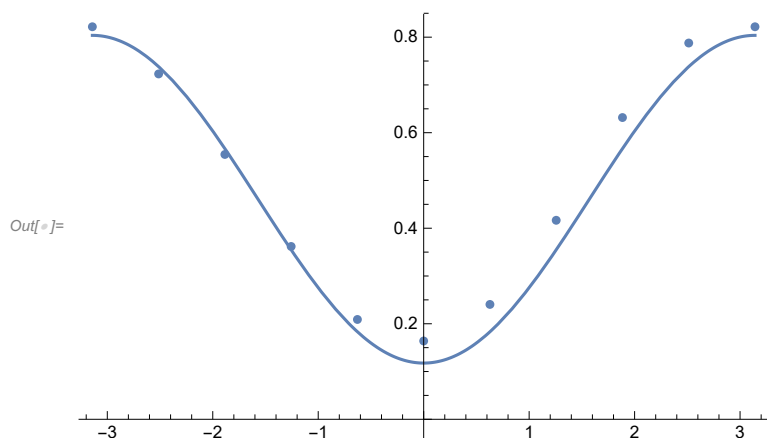
Out[●]= $\left\{\left\{-\pi, \dfrac{1683}{2048}\right\}, \left\{-2.51327, \dfrac{5923}{8192}\right\}, \left\{-1.88496, \dfrac{2271}{4096}\right\},\right.$

$\left\{-1.25664, \dfrac{741}{2048}\right\}, \left\{-0.628319, \dfrac{107}{512}\right\}, \left\{0., \dfrac{1343}{8192}\right\}, \left\{0.628319, \dfrac{985}{4096}\right\},$

$\left.\left\{1.25664, \dfrac{3413}{8192}\right\}, \left\{1.88496, \dfrac{5175}{8192}\right\}, \left\{2.51327, \dfrac{6453}{8192}\right\}, \left\{3.14159, \dfrac{1683}{2048}\right\}\right\}$

Out[●]=
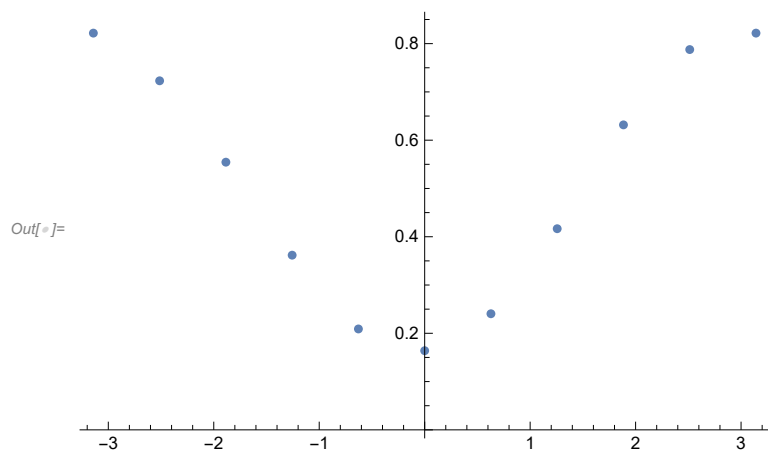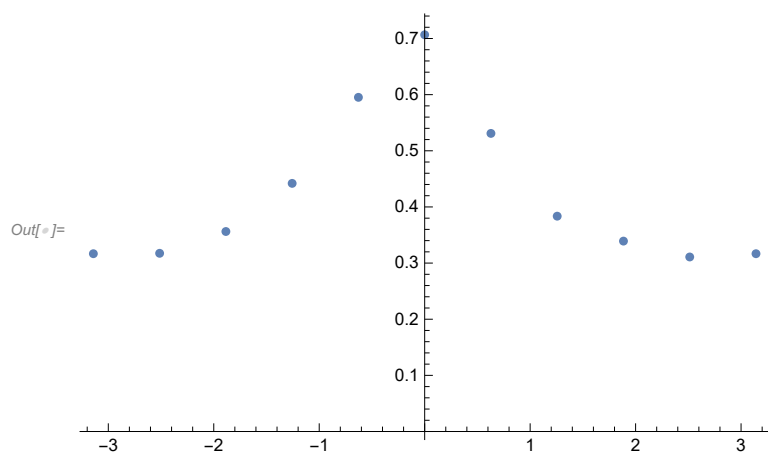
In[●]:= **Show[cosTH, ExpCosSqibmnairobi]**

Out[●]=

In[ ]:= **Show[decTH, ExpDecisivenessibmnairobi]**

Out[ ]=
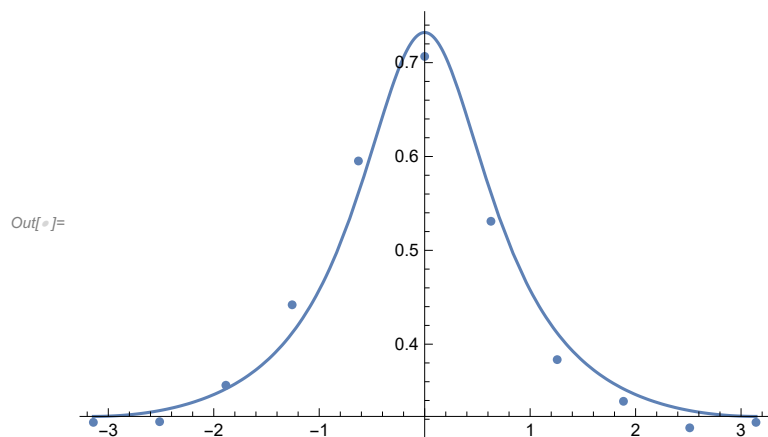
In[ ]:= **(*ibm_oslo*)**
ZeroZeroFirst10ibmoslo = 2130
ZeroOneFirst10ibmoslo = 1536
OneZeroFirst10ibmoslo = 4315
OneOneFirst10ibmoslo = 211

ZeroZeroFirst08ibmoslo = 2020
ZeroOneFirst08ibmoslo = 1943
OneZeroFirst08ibmoslo = 3971
OneOneFirst08ibmoslo = 258

ZeroZeroFirst06ibmoslo = 1836
ZeroOneFirst06ibmoslo = 3035
OneZeroFirst06ibmoslo = 2873
OneOneFirst06ibmoslo = 448

ZeroZeroFirst04ibmoslo = 1387
ZeroOneFirst04ibmoslo = 4348
OneZeroFirst04ibmoslo = 1659
OneOneFirst04ibmoslo = 798

ZeroZeroFirst02ibmoslo = 974
ZeroOneFirst02ibmoslo = 5537
OneZeroFirst02ibmoslo = 758
OneOneFirst02ibmoslo = 923

ZeroZeroFirst00ibmoslo = 819
ZeroOneFirst00ibmoslo = 5812
OneZeroFirst00ibmoslo = 353
OneOneFirst00ibmoslo = 1208

ZeroZeroSecond02ibmoslo = 862
ZeroOneSecond02ibmoslo = 5430
OneZeroSecond02ibmoslo = 802
OneOneSecond02ibmoslo = 1098

```
ZeroZeroSecond04ibmoslo = 1128
ZeroOneSecond04ibmoslo = 4451
OneZeroSecond04ibmoslo = 1741
OneOneSecond04ibmoslo = 872

ZeroZeroSecond06ibmoslo = 1578
ZeroOneSecond06ibmoslo = 3104
OneZeroSecond06ibmoslo = 2942
OneOneSecond06ibmoslo = 568

ZeroZeroSecond08ibmoslo = 1978
ZeroOneSecond08ibmoslo = 2077
OneZeroSecond08ibmoslo = 3835
OneOneSecond08ibmoslo = 302

ZeroZeroSecond10ibmoslo = 2130
ZeroOneSecond10ibmoslo = 1536
OneZeroSecond10ibmoslo = 4315
OneOneSecond10ibmoslo = 211

CosSqibmoslo =
  {{-1 * π, ZeroZeroSecond10ibmoslo / (OneZeroSecond10ibmoslo + ZeroZeroSecond10ibmoslo)},
   {-0.8 * π, ZeroZeroSecond08ibmoslo / (OneZeroSecond08ibmoslo + ZeroZeroSecond08ibmoslo)},
   {-0.6 * π, ZeroZeroSecond06ibmoslo / (OneZeroSecond06ibmoslo + ZeroZeroSecond06ibmoslo)},
   {-0.4 * π, ZeroZeroSecond04ibmoslo / (OneZeroSecond04ibmoslo + ZeroZeroSecond04ibmoslo)},
   {-0.2 * π, ZeroZeroSecond02ibmoslo / (OneZeroSecond02ibmoslo + ZeroZeroSecond02ibmoslo)},
   {0.0 * π, ZeroZeroFirst00ibmoslo / (OneZeroFirst00ibmoslo + ZeroZeroFirst00ibmoslo)},
   {0.2 * π, ZeroZeroFirst02ibmoslo / (OneZeroFirst02ibmoslo + ZeroZeroFirst02ibmoslo)},
   {0.4 * π, ZeroZeroFirst04ibmoslo / (OneZeroFirst04ibmoslo + ZeroZeroFirst04ibmoslo)},
   {0.6 * π, ZeroZeroFirst06ibmoslo / (OneZeroFirst06ibmoslo + ZeroZeroFirst06ibmoslo)},
   {0.8 * π, ZeroZeroFirst08ibmoslo / (OneZeroFirst08ibmoslo + ZeroZeroFirst08ibmoslo)},
   {1 * π, ZeroZeroFirst10ibmoslo / (OneZeroFirst10ibmoslo + ZeroZeroFirst10ibmoslo)}}
Decisivenessibmoslo = {{-1 * π, (OneZeroSecond10ibmoslo + ZeroZeroSecond10ibmoslo) / 8192},
   {-0.8 * π, (OneZeroSecond08ibmoslo + ZeroZeroSecond08ibmoslo) / 8192},
   {-0.6 * π, (OneZeroSecond06ibmoslo + ZeroZeroSecond06ibmoslo) / 8192},
   {-0.4 * π, (OneZeroSecond04ibmoslo + ZeroZeroSecond04ibmoslo) / 8192},
   {-0.2 * π, (OneZeroSecond02ibmoslo + ZeroZeroSecond02ibmoslo) / 8192},
   {-0.0 * π, (OneZeroFirst00ibmoslo + ZeroZeroFirst00ibmoslo) / 8192},
   {0.2 * π, (OneZeroFirst02ibmoslo + ZeroZeroFirst02ibmoslo) / 8192},
   {0.4 * π, (OneZeroFirst04ibmoslo + ZeroZeroFirst04ibmoslo) / 8192},
   {0.6 * π, (OneZeroFirst06ibmoslo + ZeroZeroFirst06ibmoslo) / 8192},
   {0.8 * π, (OneZeroFirst08ibmoslo + ZeroZeroFirst08ibmoslo) / 8192},
   {1.0 * π, (OneZeroFirst10ibmoslo + ZeroZeroFirst10ibmoslo) / 8192}}
ExpCosSqibmoslo = ListPlot[CosSqibmoslo]
ExpDecisivenessibmoslo = ListPlot[Decisivenessibmoslo]
```

Out[ ]= 2130

Out[ ]= 1536

Out[•]= 4315

Out[•]= 211

Out[•]= 2020

Out[•]= 1943

Out[•]= 3971

Out[•]= 258

Out[•]= 1836

Out[•]= 3035

Out[•]= 2873

Out[•]= 448

Out[•]= 1387

Out[•]= 4348

Out[•]= 1659

Out[•]= 798

Out[•]= 974

Out[•]= 5537

Out[•]= 758

Out[•]= 923

Out[•]= 819

Out[•]= 5812

Out[•]= 353

Out[•]= 1208

Out[•]= 862

Out[•]= 5430

Out[•]= 802

Out[•]= 1098

Out[•]= 1128

Out[•]= 4451

Out[•]= 1741

Out[•]= 872

Out[•]= 1578

Out[●]= 3104

Out[●]= 2942

Out[●]= 568

Out[●]= 1978

Out[●]= 2077

Out[●]= 3835

Out[●]= 302

Out[●]= 2130
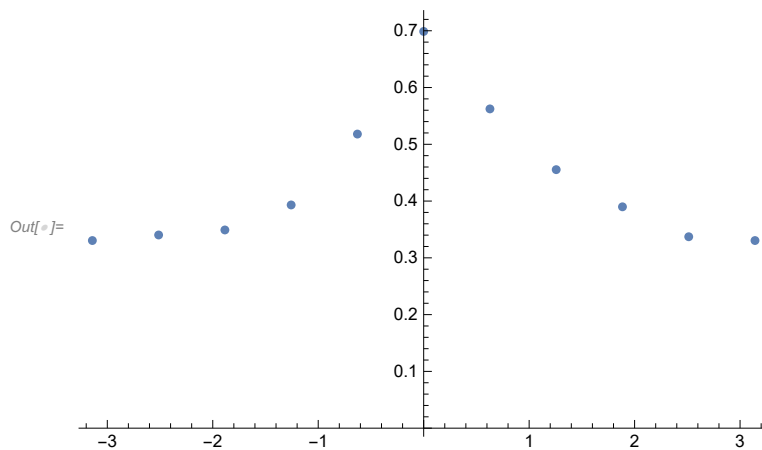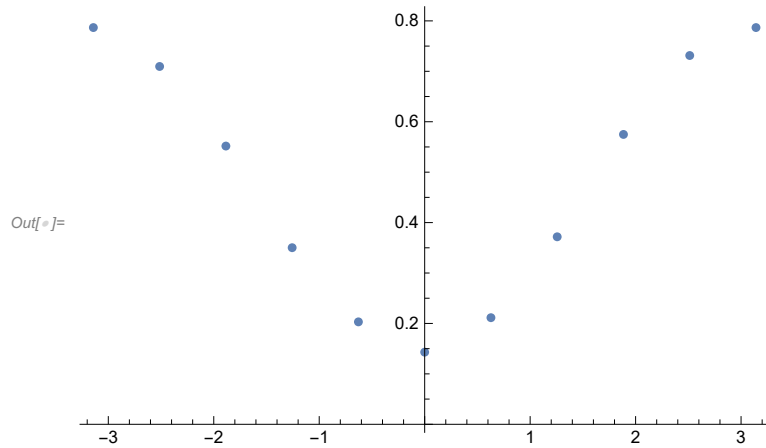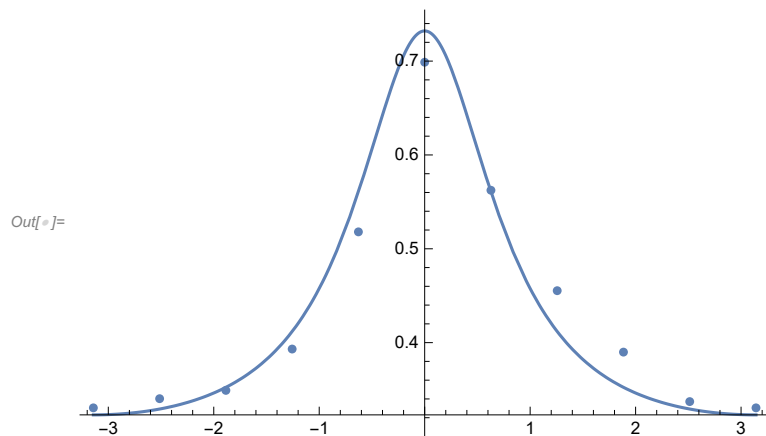
Out[●]= 1536

Out[●]= 4315

Out[●]= 211

Out[●]= $\left\{\left\{-\pi, \frac{426}{1289}\right\}, \left\{-2.51327, \frac{1978}{5813}\right\}, \left\{-1.88496, \frac{789}{2260}\right\}, \right.$
$\left\{-1.25664, \frac{1128}{2869}\right\}, \left\{-0.628319, \frac{431}{832}\right\}, \left\{0., \frac{819}{1172}\right\}, \left\{0.628319, \frac{487}{866}\right\},$
$\left.\left\{1.25664, \frac{1387}{3046}\right\}, \left\{1.88496, \frac{108}{277}\right\}, \left\{2.51327, \frac{2020}{5991}\right\}, \left\{\pi, \frac{426}{1289}\right\}\right\}$

Out[●]= $\left\{\left\{-\pi, \frac{6445}{8192}\right\}, \left\{-2.51327, \frac{5813}{8192}\right\}, \left\{-1.88496, \frac{565}{1024}\right\}, \right.$
$\left\{-1.25664, \frac{2869}{8192}\right\}, \left\{-0.628319, \frac{13}{64}\right\}, \left\{0., \frac{293}{2048}\right\}, \left\{0.628319, \frac{433}{2048}\right\},$
$\left.\left\{1.25664, \frac{1523}{4096}\right\}, \left\{1.88496, \frac{4709}{8192}\right\}, \left\{2.51327, \frac{5991}{8192}\right\}, \left\{3.14159, \frac{6445}{8192}\right\}\right\}$
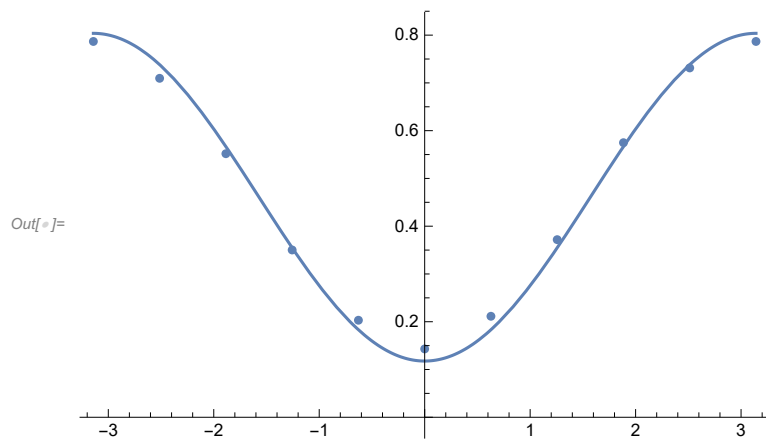
Out[●]=

Out[ ]=

In[ ]:= **Show[cosTH, ExpCosSqibmoslo]**

Out[ ]=

In[ ]:= **Show[decTH, ExpDecisivenessibmoslo]**

Out[ ]=

In[ ]:= **(*ibmq_manila*)**
ZeroZeroFirst10ibmqmanila = 2250
ZeroOneFirst10ibmqmanila = 1438
OneZeroFirst10ibmqmanila = 4209
OneOneFirst10ibmqmanila = 295

ZeroZeroFirst08ibmqmanila = 2244

```
ZeroOneFirst08ibmqmanila = 1733
OneZeroFirst08ibmqmanila = 3818
OneOneFirst08ibmqmanila = 397

ZeroZeroFirst06ibmqmanila = 1729
ZeroOneFirst06ibmqmanila = 2951
OneZeroFirst06ibmqmanila = 2867
OneOneFirst06ibmqmanila = 645

ZeroZeroFirst04ibmqmanila = 1349
ZeroOneFirst04ibmqmanila = 4342
OneZeroFirst04ibmqmanila = 1603
OneOneFirst04ibmqmanila = 898

ZeroZeroFirst02ibmqmanila = 1010
ZeroOneFirst02ibmqmanila = 5462
OneZeroFirst02ibmqmanila = 623
OneOneFirst02ibmqmanila = 1097

ZeroZeroFirst00ibmqmanila = 842
ZeroOneFirst00ibmqmanila = 5740
OneZeroFirst00ibmqmanila = 335
OneOneFirst00ibmqmanila = 1275

ZeroZeroSecond02ibmqmanila = 1027
ZeroOneSecond02ibmqmanila = 5142
OneZeroSecond02ibmqmanila = 823
OneOneSecond02ibmqmanila = 1200

ZeroZeroSecond04ibmqmanila = 1509
ZeroOneSecond04ibmqmanila = 4030
OneZeroSecond04ibmqmanila = 1772
OneOneSecond04ibmqmanila = 881

ZeroZeroSecond06ibmqmanila = 1976
ZeroOneSecond06ibmqmanila = 2838
OneZeroSecond06ibmqmanila = 2800
OneOneSecond06ibmqmanila = 578

ZeroZeroSecond08ibmqmanila = 2152
ZeroOneSecond08ibmqmanila = 1998
OneZeroSecond08ibmqmanila = 3686
OneOneSecond08ibmqmanila = 356

ZeroZeroSecond10ibmqmanila = 2250
ZeroOneSecond10ibmqmanila = 1438
OneZeroSecond10ibmqmanila = 4209
OneOneSecond10ibmqmanila = 295
```

$$\text{CosSqibmqmanila} = \left\{\left\{-1 * \pi,\right.\right.$$
$$\left.\text{ZeroZeroSecond10ibmqmanila} \big/ \left(\text{OneZeroSecond10ibmqmanila} + \text{ZeroZeroSecond10ibmqmanila}\right)\right\},$$

```
      {-0.8 * π, ZeroZeroSecond08ibmqmanila /
        (OneZeroSecond08ibmqmanila + ZeroZeroSecond08ibmqmanila)}, {-0.6 * π,
       ZeroZeroSecond06ibmqmanila / (OneZeroSecond06ibmqmanila + ZeroZeroSecond06ibmqmanila)},
      {-0.4 * π, ZeroZeroSecond04ibmqmanila /
        (OneZeroSecond04ibmqmanila + ZeroZeroSecond04ibmqmanila)}, {-0.2 * π,
       ZeroZeroSecond02ibmqmanila / (OneZeroSecond02ibmqmanila + ZeroZeroSecond02ibmqmanila)},
      {0.0 * π, ZeroZeroFirst00ibmqmanila /
        (OneZeroFirst00ibmqmanila + ZeroZeroFirst00ibmqmanila)}, {0.2 * π,
       ZeroZeroFirst02ibmqmanila / (OneZeroFirst02ibmqmanila + ZeroZeroFirst02ibmqmanila)},
      {0.4 * π, ZeroZeroFirst04ibmqmanila /
        (OneZeroFirst04ibmqmanila + ZeroZeroFirst04ibmqmanila)}, {0.6 * π,
       ZeroZeroFirst06ibmqmanila / (OneZeroFirst06ibmqmanila + ZeroZeroFirst06ibmqmanila)},
      {0.8 * π, ZeroZeroFirst08ibmqmanila /
        (OneZeroFirst08ibmqmanila + ZeroZeroFirst08ibmqmanila)}, {1 * π,
       ZeroZeroFirst10ibmqmanila / (OneZeroFirst10ibmqmanila + ZeroZeroFirst10ibmqmanila)}}}
    Decisivenessibmqmanila = {{-1 * π, (OneZeroSecond10ibmqmanila + ZeroZeroSecond10ibmqmanila) /
        8192}, {-0.8 * π, (OneZeroSecond08ibmqmanila + ZeroZeroSecond08ibmqmanila) / 8192},
      {-0.6 * π, (OneZeroSecond06ibmqmanila + ZeroZeroSecond06ibmqmanila) / 8192},
      {-0.4 * π, (OneZeroSecond04ibmqmanila + ZeroZeroSecond04ibmqmanila) / 8192},
      {-0.2 * π, (OneZeroSecond02ibmqmanila + ZeroZeroSecond02ibmqmanila) / 8192},
      {-0.0 * π, (OneZeroFirst00ibmqmanila + ZeroZeroFirst00ibmqmanila) / 8192},
      {0.2 * π, (OneZeroFirst02ibmqmanila + ZeroZeroFirst02ibmqmanila) / 8192},
      {0.4 * π, (OneZeroFirst04ibmqmanila + ZeroZeroFirst04ibmqmanila) / 8192},
      {0.6 * π, (OneZeroFirst06ibmqmanila + ZeroZeroFirst06ibmqmanila) / 8192},
      {0.8 * π, (OneZeroFirst08ibmqmanila + ZeroZeroFirst08ibmqmanila) / 8192},
      {1.0 * π, (OneZeroFirst10ibmqmanila + ZeroZeroFirst10ibmqmanila) / 8192}}
    ExpCosSqibmqmanila = ListPlot[CosSqibmqmanila]
    ExpDecisivenessibmqmanila = ListPlot[Decisivenessibmqmanila]
```

Out[ ]= 2250

Out[ ]= 1438

Out[ ]= 4209

Out[ ]= 295

Out[ ]= 2244

Out[ ]= 1733

Out[ ]= 3818

Out[ ]= 397

Out[ ]= 1729

Out[ ]= 2951

Out[ ]= 2867

Out[ ]= 645

Out[ ]= 1349

Out[ ]= 4342

Out[ ]= 1603

Out[ ]= 898

Out[ ]= 1010

Out[ ]= 5462

Out[ ]= 623

Out[ ]= 1097

Out[ ]= 842

Out[ ]= 5740

Out[ ]= 335

Out[ ]= 1275

Out[ ]= 1027

Out[ ]= 5142

Out[ ]= 823

Out[ ]= 1200

Out[ ]= 1509

Out[ ]= 4030

Out[ ]= 1772

Out[ ]= 881

Out[ ]= 1976

Out[ ]= 2838

Out[ ]= 2800

Out[ ]= 578

Out[ ]= 2152

Out[ ]= 1998

Out[ ]= 3686

Out[ ]= 356
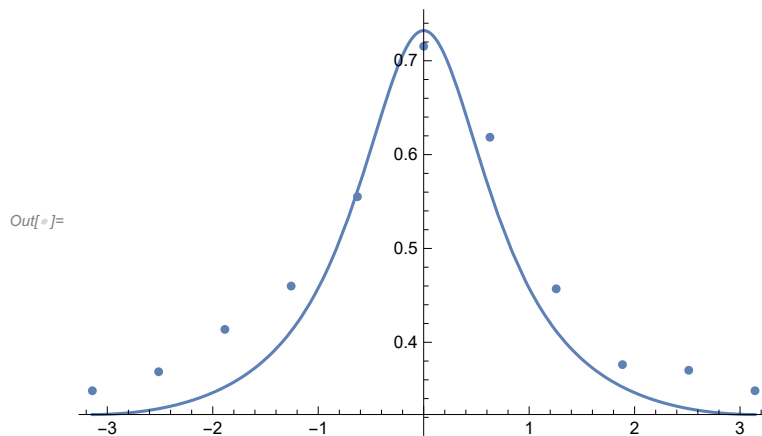
Out[ ]= 2250

Out[ ]= 1438

Out[ ]= 4209

Out[ ]= 295

Out[ ]= $\left\{\left\{-\pi, \dfrac{750}{2153}\right\}, \left\{-2.51327, \dfrac{1076}{2919}\right\}, \left\{-1.88496, \dfrac{247}{597}\right\},\right.$

$\left\{-1.25664, \dfrac{1509}{3281}\right\}, \left\{-0.628319, \dfrac{1027}{1850}\right\}, \left\{0., \dfrac{842}{1177}\right\}, \left\{0.628319, \dfrac{1010}{1633}\right\},$

$\left.\left\{1.25664, \dfrac{1349}{2952}\right\}, \left\{1.88496, \dfrac{1729}{4596}\right\}, \left\{2.51327, \dfrac{1122}{3031}\right\}, \left\{\pi, \dfrac{750}{2153}\right\}\right\}$
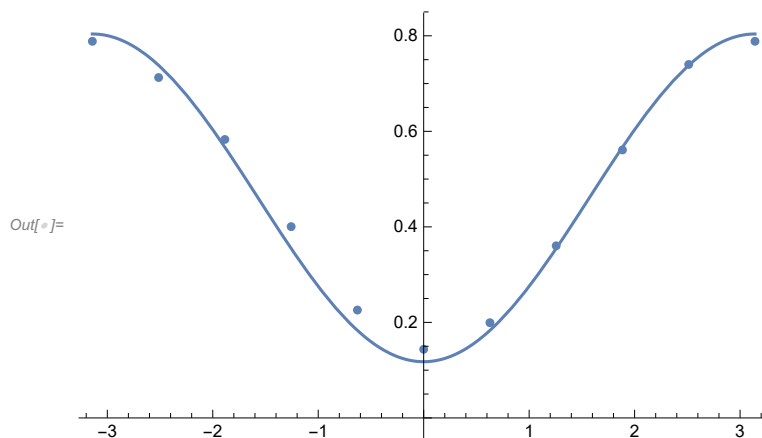
Out[ ]= $\left\{\left\{-\pi, \dfrac{6459}{8192}\right\}, \left\{-2.51327, \dfrac{2919}{4096}\right\}, \left\{-1.88496, \dfrac{597}{1024}\right\},\right.$

$\left\{-1.25664, \dfrac{3281}{8192}\right\}, \left\{-0.628319, \dfrac{925}{4096}\right\}, \left\{0., \dfrac{1177}{8192}\right\}, \left\{0.628319, \dfrac{1633}{8192}\right\},$

$\left.\left\{1.25664, \dfrac{369}{1024}\right\}, \left\{1.88496, \dfrac{1149}{2048}\right\}, \left\{2.51327, \dfrac{3031}{4096}\right\}, \left\{3.14159, \dfrac{6459}{8192}\right\}\right\}$

Out[ ]=

Out[ ]=
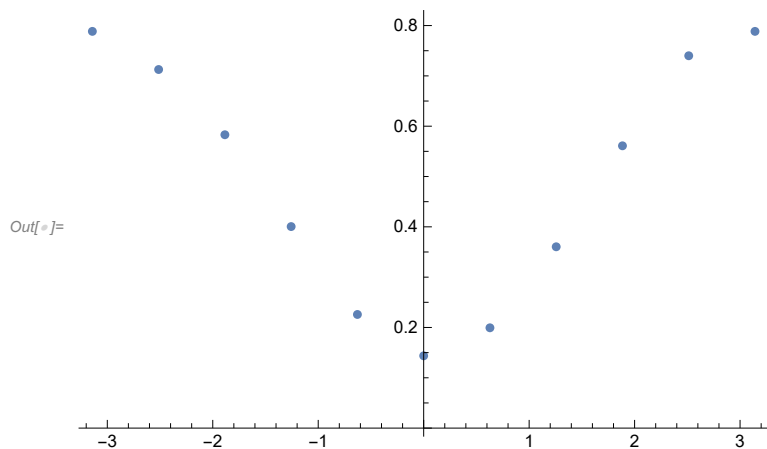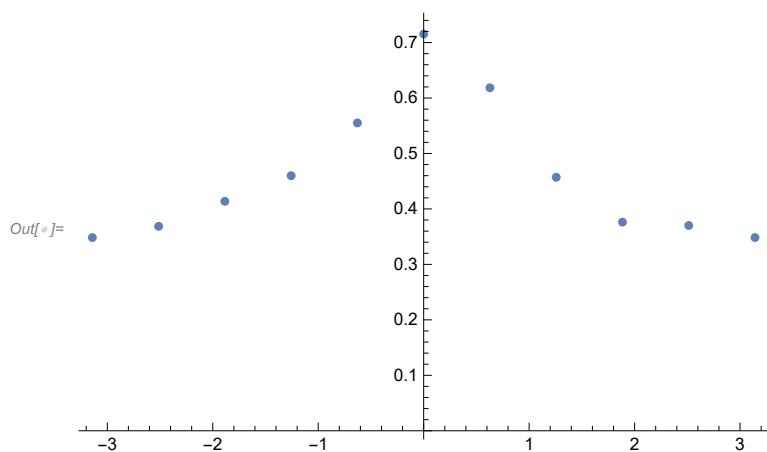
In[ ]:= **Show[cosTH, ExpCosSqibmqmanila]**

Out[ ]=

In[ ]:= **Show[decTH, ExpDecisivenessibmqmanila]**

Out[ ]=

In[ ]:= **(*ibmq_quito*)**
ZeroZeroFirst10ibmqquito = 2205
ZeroOneFirst10ibmqquito = 1154
OneZeroFirst10ibmqquito = 4639
OneOneFirst10ibmqquito = 194

ZeroZeroFirst08ibmqquito = 2006
ZeroOneFirst08ibmqquito = 1421
OneZeroFirst08ibmqquito = 4385
OneOneFirst08ibmqquito = 380

ZeroZeroFirst06ibmqquito = 1620
ZeroOneFirst06ibmqquito = 2586
OneZeroFirst06ibmqquito = 3171
OneOneFirst06ibmqquito = 815

ZeroZeroFirst04ibmqquito = 1281
ZeroOneFirst04ibmqquito = 4067
OneZeroFirst04ibmqquito = 1701
OneOneFirst04ibmqquito = 1143

```
ZeroZeroFirst02ibmqquito = 1126
ZeroOneFirst02ibmqquito = 5062
OneZeroFirst02ibmqquito = 687
OneOneFirst02ibmqquito = 1317

ZeroZeroFirst00ibmqquito = 1208
ZeroOneFirst00ibmqquito = 5379
OneZeroFirst00ibmqquito = 268
OneOneFirst00ibmqquito = 1337

ZeroZeroSecond02ibmqquito = 1325
ZeroOneSecond02ibmqquito = 5162
OneZeroSecond02ibmqquito = 453
OneOneSecond02ibmqquito = 1252

ZeroZeroSecond04ibmqquito = 1725
ZeroOneSecond04ibmqquito = 4342
OneZeroSecond04ibmqquito = 1180
OneOneSecond04ibmqquito = 945

ZeroZeroSecond06ibmqquito = 1935
ZeroOneSecond06ibmqquito = 3201
OneZeroSecond06ibmqquito = 2412
OneOneSecond06ibmqquito = 644

ZeroZeroSecond08ibmqquito = 2227
ZeroOneSecond08ibmqquito = 1841
OneZeroSecond08ibmqquito = 3796
OneOneSecond08ibmqquito = 328

ZeroZeroSecond10ibmqquito = 2205
ZeroOneSecond10ibmqquito = 1154
OneZeroSecond10ibmqquito = 4639
OneOneSecond10ibmqquito = 194
```

```
CosSqibmqquito = {{-1 * π,
   ZeroZeroSecond10ibmqquito / (OneZeroSecond10ibmqquito + ZeroZeroSecond10ibmqquito)},
  {-0.8 * π, ZeroZeroSecond08ibmqquito /
    (OneZeroSecond08ibmqquito + ZeroZeroSecond08ibmqquito)}, {-0.6 * π,
   ZeroZeroSecond06ibmqquito / (OneZeroSecond06ibmqquito + ZeroZeroSecond06ibmqquito)},
  {-0.4 * π, ZeroZeroSecond04ibmqquito /
    (OneZeroSecond04ibmqquito + ZeroZeroSecond04ibmqquito)}, {-0.2 * π,
   ZeroZeroSecond02ibmqquito / (OneZeroSecond02ibmqquito + ZeroZeroSecond02ibmqquito)},
  {0.0 * π, ZeroZeroFirst00ibmqquito / (OneZeroFirst00ibmqquito + ZeroZeroFirst00ibmqquito)},
  {0.2 * π, ZeroZeroFirst02ibmqquito / (OneZeroFirst02ibmqquito + ZeroZeroFirst02ibmqquito)},
  {0.4 * π, ZeroZeroFirst04ibmqquito / (OneZeroFirst04ibmqquito + ZeroZeroFirst04ibmqquito)},
  {0.6 * π, ZeroZeroFirst06ibmqquito / (OneZeroFirst06ibmqquito + ZeroZeroFirst06ibmqquito)},
  {0.8 * π, ZeroZeroFirst08ibmqquito / (OneZeroFirst08ibmqquito + ZeroZeroFirst08ibmqquito)},
  {1 * π, ZeroZeroFirst10ibmqquito / (OneZeroFirst10ibmqquito + ZeroZeroFirst10ibmqquito)}}}
Decisivenessibmqquito =
```

```
{{-1 * π, (OneZeroSecond10ibmqquito + ZeroZeroSecond10ibmqquito) / 8192},
 {-0.8 * π, (OneZeroSecond08ibmqquito + ZeroZeroSecond08ibmqquito) / 8192},
 {-0.6 * π, (OneZeroSecond06ibmqquito + ZeroZeroSecond06ibmqquito) / 8192},
 {-0.4 * π, (OneZeroSecond04ibmqquito + ZeroZeroSecond04ibmqquito) / 8192},
 {-0.2 * π, (OneZeroSecond02ibmqquito + ZeroZeroSecond02ibmqquito) / 8192},
 {-0.0 * π, (OneZeroFirst00ibmqquito + ZeroZeroFirst00ibmqquito) / 8192},
 {0.2 * π, (OneZeroFirst02ibmqquito + ZeroZeroFirst02ibmqquito) / 8192},
 {0.4 * π, (OneZeroFirst04ibmqquito + ZeroZeroFirst04ibmqquito) / 8192},
 {0.6 * π, (OneZeroFirst06ibmqquito + ZeroZeroFirst06ibmqquito) / 8192},
 {0.8 * π, (OneZeroFirst08ibmqquito + ZeroZeroFirst08ibmqquito) / 8192},
 {1.0 * π, (OneZeroFirst10ibmqquito + ZeroZeroFirst10ibmqquito) / 8192}}
ExpCosSqibmqquito = ListPlot[CosSqibmqquito]
ExpDecisivenessibmqquito = ListPlot[Decisivenessibmqquito]
```

Out[ ]= 2205

Out[ ]= 1154

Out[ ]= 4639

Out[ ]= 194

Out[ ]= 2006

Out[ ]= 1421

Out[ ]= 4385

Out[ ]= 380

Out[ ]= 1620

Out[ ]= 2586

Out[ ]= 3171

Out[ ]= 815

Out[ ]= 1281

Out[ ]= 4067

Out[ ]= 1701

Out[ ]= 1143

Out[ ]= 1126

Out[ ]= 5062

Out[ ]= 687

Out[ ]= 1317

Out[ ]= 1208

Out[ ]= 5379

Out[ ]= 268

Out[ ]= 1337

Out[ ]= 1325

Out[ ]= 5162

Out[ ]= 453

Out[ ]= 1252

Out[ ]= 1725

Out[ ]= 4342

Out[ ]= 1180

Out[ ]= 945

Out[ ]= 1935

Out[ ]= 3201

Out[ ]= 2412

Out[ ]= 644

Out[ ]= 2227

Out[ ]= 1841

Out[ ]= 3796

Out[ ]= 328

Out[ ]= 2205

Out[ ]= 1154

Out[ ]= 4639

Out[ ]= 194

Out[ ]= $\left\{ \left\{ -\pi, \frac{2205}{6844} \right\}, \left\{ -2.51327, \frac{2227}{6023} \right\}, \left\{ -1.88496, \frac{215}{483} \right\}, \left\{ -1.25664, \frac{345}{581} \right\}, \left\{ -0.628319, \frac{1325}{1778} \right\}, \left\{ 0., \frac{302}{369} \right\}, \left\{ 0.628319, \frac{1126}{1813} \right\}, \left\{ 1.25664, \frac{61}{142} \right\}, \left\{ 1.88496, \frac{540}{1597} \right\}, \left\{ 2.51327, \frac{2006}{6391} \right\}, \left\{ \pi, \frac{2205}{6844} \right\} \right\}$

Out[ ]= $\left\{ \left\{ -\pi, \frac{1711}{2048} \right\}, \left\{ -2.51327, \frac{6023}{8192} \right\}, \left\{ -1.88496, \frac{4347}{8192} \right\}, \left\{ -1.25664, \frac{2905}{8192} \right\}, \left\{ -0.628319, \frac{889}{4096} \right\}, \left\{ 0., \frac{369}{2048} \right\}, \left\{ 0.628319, \frac{1813}{8192} \right\}, \left\{ 1.25664, \frac{1491}{4096} \right\}, \left\{ 1.88496, \frac{4791}{8192} \right\}, \left\{ 2.51327, \frac{6391}{8192} \right\}, \left\{ 3.14159, \frac{1711}{2048} \right\} \right\}$

Out[ ]=

Out[ ]=
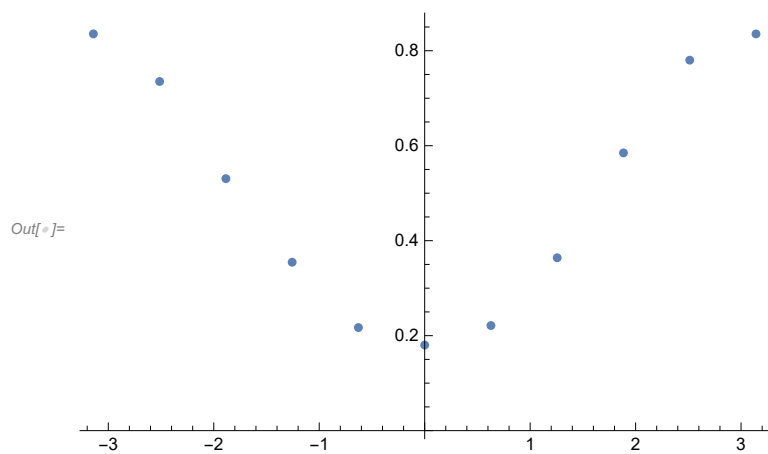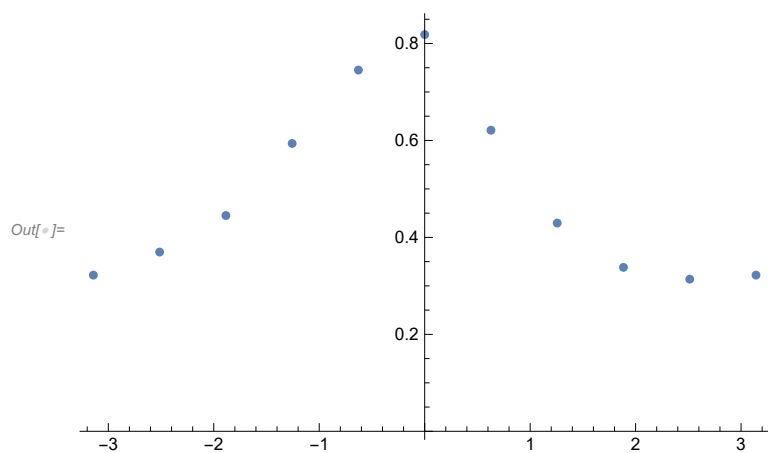
In[ ]:= **Show[cosTH, ExpCosSqibmqquito]**

Out[ ]=

In[ ]:= **Show[decTH, ExpDecisivenessibmqquito]**

Out[ ]=
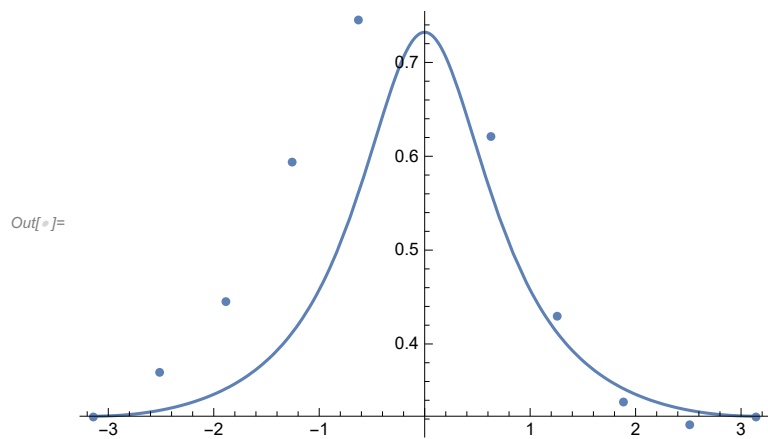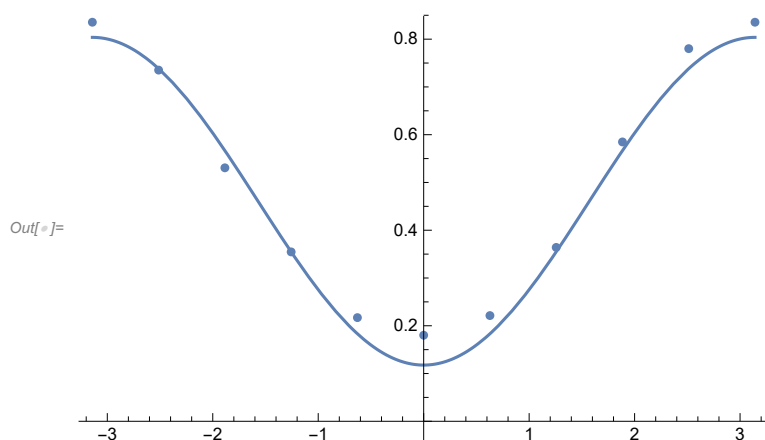
In[ ]:= **(*ibmq_lima*)**
ZeroZeroFirst10ibmqlima = 2454
ZeroOneFirst10ibmqlima = 1284
OneZeroFirst10ibmqlima = 4284
OneOneFirst10ibmqlima = 170

ZeroZeroFirst08ibmqlima = 2336
ZeroOneFirst08ibmqlima = 1787
OneZeroFirst08ibmqlima = 3868
OneOneFirst08ibmqlima = 201

ZeroZeroFirst06ibmqlima = 2222
ZeroOneFirst06ibmqlima = 2720
OneZeroFirst06ibmqlima = 2837
OneOneFirst06ibmqlima = 413

ZeroZeroFirst04ibmqlima = 1663
ZeroOneFirst04ibmqlima = 3963
OneZeroFirst04ibmqlima = 1758
OneOneFirst04ibmqlima = 808

ZeroZeroFirst02ibmqlima = 1408
ZeroOneFirst02ibmqlima = 4825
OneZeroFirst02ibmqlima = 871
OneOneFirst02ibmqlima = 1088

ZeroZeroFirst00ibmqlima = 1342
ZeroOneFirst00ibmqlima = 4995
OneZeroFirst00ibmqlima = 604
OneOneFirst00ibmqlima = 1251

ZeroZeroSecond02ibmqlima = 1561
ZeroOneSecond02ibmqlima = 4602
OneZeroSecond02ibmqlima = 879
OneOneSecond02ibmqlima = 1150

```
ZeroZeroSecond04ibmqlima = 1809
ZeroOneSecond04ibmqlima = 3876
OneZeroSecond04ibmqlima = 1673
OneOneSecond04ibmqlima =  834

ZeroZeroSecond06ibmqlima = 2144
ZeroOneSecond06ibmqlima = 2675
OneZeroSecond06ibmqlima = 2727
OneOneSecond06ibmqlima = 646

ZeroZeroSecond08ibmqlima = 2244
ZeroOneSecond08ibmqlima = 1821
OneZeroSecond08ibmqlima = 3690
OneOneSecond08ibmqlima = 437

ZeroZeroSecond10ibmqlima = 2454
ZeroOneSecond10ibmqlima = 1284
OneZeroSecond10ibmqlima = 4284
OneOneSecond10ibmqlima = 170

CosSqibmqlima =
  {{-1 * π, ZeroZeroSecond10ibmqlima / (OneZeroSecond10ibmqlima + ZeroZeroSecond10ibmqlima)},
   {-0.8 * π, ZeroZeroSecond08ibmqlima /
      (OneZeroSecond08ibmqlima + ZeroZeroSecond08ibmqlima)}, {-0.6 * π,
    ZeroZeroSecond06ibmqlima / (OneZeroSecond06ibmqlima + ZeroZeroSecond06ibmqlima)},
   {-0.4 * π, ZeroZeroSecond04ibmqlima /
      (OneZeroSecond04ibmqlima + ZeroZeroSecond04ibmqlima)}, {-0.2 * π,
    ZeroZeroSecond02ibmqlima / (OneZeroSecond02ibmqlima + ZeroZeroSecond02ibmqlima)},
   {0.0 * π, ZeroZeroFirst00ibmqlima / (OneZeroFirst00ibmqlima + ZeroZeroFirst00ibmqlima)},
   {0.2 * π, ZeroZeroFirst02ibmqlima / (OneZeroFirst02ibmqlima + ZeroZeroFirst02ibmqlima)},
   {0.4 * π, ZeroZeroFirst04ibmqlima / (OneZeroFirst04ibmqlima + ZeroZeroFirst04ibmqlima)},
   {0.6 * π, ZeroZeroFirst06ibmqlima / (OneZeroFirst06ibmqlima + ZeroZeroFirst06ibmqlima)},
   {0.8 * π, ZeroZeroFirst08ibmqlima / (OneZeroFirst08ibmqlima + ZeroZeroFirst08ibmqlima)},
   {1 * π, ZeroZeroFirst10ibmqlima / (OneZeroFirst10ibmqlima + ZeroZeroFirst10ibmqlima)}}
Decisivenessibmqlima =
  {{-1 * π, (OneZeroSecond10ibmqlima + ZeroZeroSecond10ibmqlima) / 8192},
   {-0.8 * π, (OneZeroSecond08ibmqlima + ZeroZeroSecond08ibmqlima) / 8192},
   {-0.6 * π, (OneZeroSecond06ibmqlima + ZeroZeroSecond06ibmqlima) / 8192},
   {-0.4 * π, (OneZeroSecond04ibmqlima + ZeroZeroSecond04ibmqlima) / 8192},
   {-0.2 * π, (OneZeroSecond02ibmqlima + ZeroZeroSecond02ibmqlima) / 8192},
   {-0.0 * π, (OneZeroFirst00ibmqlima + ZeroZeroFirst00ibmqlima) / 8192},
   {0.2 * π, (OneZeroFirst02ibmqlima + ZeroZeroFirst02ibmqlima) / 8192},
   {0.4 * π, (OneZeroFirst04ibmqlima + ZeroZeroFirst04ibmqlima) / 8192},
   {0.6 * π, (OneZeroFirst06ibmqlima + ZeroZeroFirst06ibmqlima) / 8192},
   {0.8 * π, (OneZeroFirst08ibmqlima + ZeroZeroFirst08ibmqlima) / 8192},
   {1.0 * π, (OneZeroFirst10ibmqlima + ZeroZeroFirst10ibmqlima) / 8192}}
ExpCosSqibmqlima = ListPlot[CosSqibmqlima]
ExpDecisivenessibmqlima = ListPlot[Decisivenessibmqlima]
```

Out[ ]= 2454

Out[ ]= 1284

Out[ ]= 4284

Out[ ]= 170

Out[ ]= 2336

Out[ ]= 1787

Out[ ]= 3868

Out[ ]= 201

Out[ ]= 2222

Out[ ]= 2720

Out[ ]= 2837

Out[ ]= 413

Out[ ]= 1663

Out[ ]= 3963

Out[ ]= 1758

Out[ ]= 808

Out[ ]= 1408

Out[ ]= 4825

Out[ ]= 871

Out[ ]= 1088

Out[ ]= 1342

Out[ ]= 4995

Out[ ]= 604

Out[ ]= 1251

Out[ ]= 1561

Out[ ]= 4602

Out[ ]= 879

Out[ ]= 1150

Out[ ]= 1809

Out[ ]= 3876

Out[ ]= 1673

Out[●]= 834

Out[●]= 2144

Out[●]= 2675

Out[●]= 2727

Out[●]= 646

Out[●]= 2244

Out[●]= 1821

*Out[●]=* 3690

Out[●]= 437

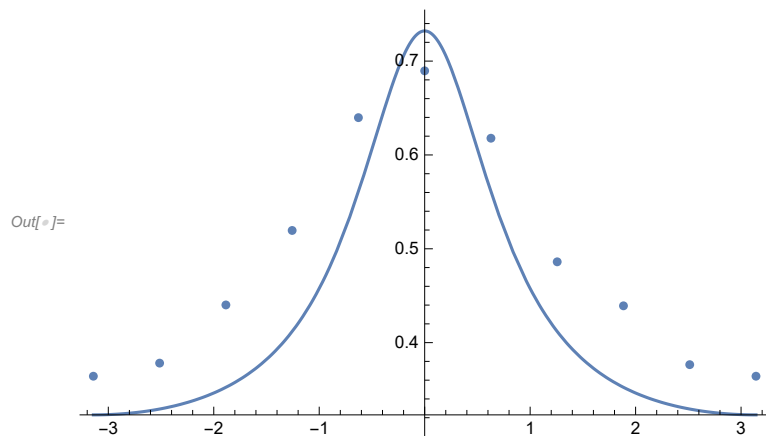*Out[●]=* 2454

Out[●]= 1284

Out[●]= 4284

Out[●]= 170

Out[●]= $\left\{\left\{-\pi, \frac{409}{1123}\right\}, \left\{-2.51327, \frac{374}{989}\right\}, \left\{-1.88496, \frac{2144}{4871}\right\},\right.$
$\left\{-1.25664, \frac{1809}{3482}\right\}, \left\{-0.628319, \frac{1561}{2440}\right\}, \left\{0., \frac{671}{973}\right\}, \left\{0.628319, \frac{1408}{2279}\right\},$
$\left.\left\{1.25664, \frac{1663}{3421}\right\}, \left\{1.88496, \frac{2222}{5059}\right\}, \left\{2.51327, \frac{584}{1551}\right\}, \left\{\pi, \frac{409}{1123}\right\}\right\}$

Out[●]= $\left\{\left\{-\pi, \frac{3369}{4096}\right\}, \left\{-2.51327, \frac{2967}{4096}\right\}, \left\{-1.88496, \frac{4871}{8192}\right\},\right.$
$\left\{-1.25664, \frac{1741}{4096}\right\}, \left\{-0.628319, \frac{305}{1024}\right\}, \left\{0., \frac{973}{4096}\right\}, \left\{0.628319, \frac{2279}{8192}\right\},$
$\left.\left\{1.25664, \frac{3421}{8192}\right\}, \left\{1.88496, \frac{5059}{8192}\right\}, \left\{2.51327, \frac{1551}{2048}\right\}, \left\{3.14159, \frac{3369}{4096}\right\}\right\}$

Out[●]=

Out[●]=
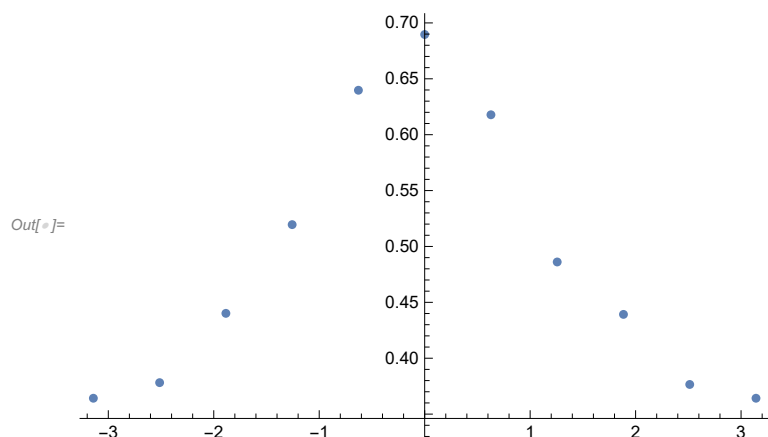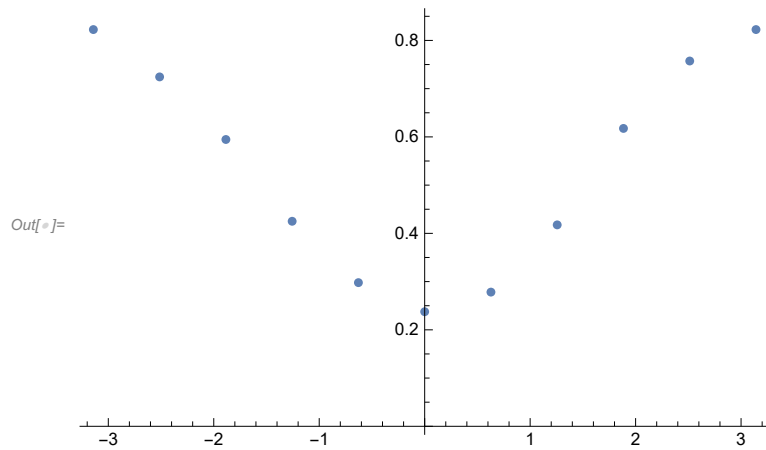
In[●]:= Show[cosTH, ExpCosSqibmqlima]

Out[●]=

In[●]:= **Show[decTH, ExpDecisivenessibmqlima]**

Out[●]=
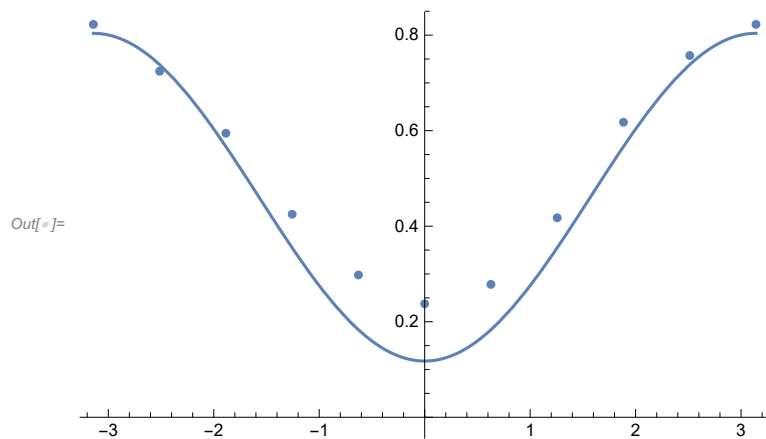
In[●]:= **(*ibmq_qasm_simulator*)**
ZeroZeroFirst10ibmqqasmsimulator = 2131
ZeroOneFirst10ibmqqasmsimulator = 1635
OneZeroFirst10ibmqqasmsimulator = 4424
OneOneFirst10ibmqqasmsimulator = 2

ZeroZeroFirst08ibmqqasmsimulator = 1979

```
ZeroOneFirst08ibmqqasmsimulator = 2063
OneZeroFirst08ibmqqasmsimulator = 4037
OneOneFirst08ibmqqasmsimulator = 113

ZeroZeroFirst06ibmqqasmsimulator = 1627
ZeroOneFirst06ibmqqasmsimulator = 3067
OneZeroFirst06ibmqqasmsimulator = 3042
OneOneFirst06ibmqqasmsimulator = 456

ZeroZeroFirst04ibmqqasmsimulator = 1214
ZeroOneFirst04ibmqqasmsimulator = 4417
OneZeroFirst04ibmqqasmsimulator = 1680
OneOneFirst04ibmqqasmsimulator = 881

ZeroZeroFirst02ibmqqasmsimulator = 835
ZeroOneFirst02ibmqqasmsimulator = 5503
OneZeroFirst02ibmqqasmsimulator = 675
OneOneFirst02ibmqqasmsimulator = 1179

ZeroZeroFirst00ibmqqasmsimulator = 728
ZeroOneFirst00ibmqqasmsimulator = 5879
OneZeroFirst00ibmqqasmsimulator = 249
OneOneFirst00ibmqqasmsimulator = 1336

ZeroZeroSecond02ibmqqasmsimulator = 901
ZeroOneSecond02ibmqqasmsimulator = 5394
OneZeroSecond02ibmqqasmsimulator = 649
OneOneSecond02ibmqqasmsimulator = 1248

ZeroZeroSecond04ibmqqasmsimulator = 1235
ZeroOneSecond04ibmqqasmsimulator = 4380
OneZeroSecond04ibmqqasmsimulator = 1692
OneOneSecond04ibmqqasmsimulator = 885

ZeroZeroSecond06ibmqqasmsimulator = 1643
ZeroOneSecond06ibmqqasmsimulator = 3115
OneZeroSecond06ibmqqasmsimulator = 2960
OneOneSecond06ibmqqasmsimulator = 474

ZeroZeroSecond08ibmqqasmsimulator = 1980
ZeroOneSecond08ibmqqasmsimulator = 1990
OneZeroSecond08ibmqqasmsimulator = 4089
OneOneSecond08ibmqqasmsimulator = 133

ZeroZeroSecond10ibmqqasmsimulator = 2131
ZeroOneSecond10ibmqqasmsimulator = 1635
OneZeroSecond10ibmqqasmsimulator = 4424
OneOneSecond10ibmqqasmsimulator = 2

CosSqibmqqasmsimulator = {{-1 * π, ZeroZeroSecond10ibmqqasmsimulator /
     (OneZeroSecond10ibmqqasmsimulator + ZeroZeroSecond10ibmqqasmsimulator)},
```

```
    {-0.8 * π, ZeroZeroSecond08ibmqqasmsimulator /
      (OneZeroSecond08ibmqqasmsimulator + ZeroZeroSecond08ibmqqasmsimulator)},
    {-0.6 * π, ZeroZeroSecond06ibmqqasmsimulator /
      (OneZeroSecond06ibmqqasmsimulator + ZeroZeroSecond06ibmqqasmsimulator)},
    {-0.4 * π, ZeroZeroSecond04ibmqqasmsimulator /
      (OneZeroSecond04ibmqqasmsimulator + ZeroZeroSecond04ibmqqasmsimulator)},
    {-0.2 * π, ZeroZeroSecond02ibmqqasmsimulator /
      (OneZeroSecond02ibmqqasmsimulator + ZeroZeroSecond02ibmqqasmsimulator)},
    {0.0 * π, ZeroZeroFirst00ibmqqasmsimulator /
      (OneZeroFirst00ibmqqasmsimulator + ZeroZeroFirst00ibmqqasmsimulator)},
    {0.2 * π, ZeroZeroFirst02ibmqqasmsimulator /
      (OneZeroFirst02ibmqqasmsimulator + ZeroZeroFirst02ibmqqasmsimulator)},
    {0.4 * π, ZeroZeroFirst04ibmqqasmsimulator /
      (OneZeroFirst04ibmqqasmsimulator + ZeroZeroFirst04ibmqqasmsimulator)},
    {0.6 * π, ZeroZeroFirst06ibmqqasmsimulator /
      (OneZeroFirst06ibmqqasmsimulator + ZeroZeroFirst06ibmqqasmsimulator)},
    {0.8 * π, ZeroZeroFirst08ibmqqasmsimulator /
      (OneZeroFirst08ibmqqasmsimulator + ZeroZeroFirst08ibmqqasmsimulator)},
    {1 * π, ZeroZeroFirst10ibmqqasmsimulator /
      (OneZeroFirst10ibmqqasmsimulator + ZeroZeroFirst10ibmqqasmsimulator)}}
Decisivenessibmqqasmsimulator = {{-1 * π,
    (OneZeroSecond10ibmqqasmsimulator + ZeroZeroSecond10ibmqqasmsimulator) / 8192},
    {-0.8 * π, (OneZeroSecond08ibmqqasmsimulator + ZeroZeroSecond08ibmqqasmsimulator) / 8192},
    {-0.6 * π, (OneZeroSecond06ibmqqasmsimulator + ZeroZeroSecond06ibmqqasmsimulator) / 8192},
    {-0.4 * π, (OneZeroSecond04ibmqqasmsimulator + ZeroZeroSecond04ibmqqasmsimulator) / 8192},
    {-0.2 * π, (OneZeroSecond02ibmqqasmsimulator + ZeroZeroSecond02ibmqqasmsimulator) / 8192},
    {-0.0 * π, (OneZeroFirst00ibmqqasmsimulator + ZeroZeroFirst00ibmqqasmsimulator) / 8192},
    {0.2 * π, (OneZeroFirst02ibmqqasmsimulator + ZeroZeroFirst02ibmqqasmsimulator) / 8192},
    {0.4 * π, (OneZeroFirst04ibmqqasmsimulator + ZeroZeroFirst04ibmqqasmsimulator) / 8192},
    {0.6 * π, (OneZeroFirst06ibmqqasmsimulator + ZeroZeroFirst06ibmqqasmsimulator) / 8192},
    {0.8 * π, (OneZeroFirst08ibmqqasmsimulator + ZeroZeroFirst08ibmqqasmsimulator) / 8192},
    {1.0 * π, (OneZeroFirst10ibmqqasmsimulator + ZeroZeroFirst10ibmqqasmsimulator) / 8192}}
ExpCosSqibmqqasmsimulator = ListPlot[CosSqibmqqasmsimulator]
ExpDecisivenessibmqqasmsimulator = ListPlot[Decisivenessibmqqasmsimulator]
```

Out[●]= 2131

Out[●]= 1635

Out[●]= 4424

Out[●]= 2

Out[●]= 1979

Out[●]= 2063

Out[●]= 4037

Out[●]= 113

Out[●]= 1627

Out[●]= 3067

Out[●]= 3042

Out[●]= 456

Out[●]= 1214

Out[●]= 4417

Out[●]= 1680

Out[●]= 881

Out[●]= 835

Out[●]= 5503

Out[●]= 675

Out[●]= 1179

Out[●]= 728

Out[●]= 5879

Out[●]= 249

Out[●]= 1336

Out[●]= 901

Out[●]= 5394

Out[●]= 649

Out[●]= 1248

Out[●]= 1235

Out[●]= 4380

Out[●]= 1692

Out[●]= 885

Out[●]= 1643

Out[●]= 3115

Out[●]= 2960

Out[●]= 474

Out[●]= 1980

Out[●]= 1990

Out[●]= 4089

Out[ ]= 133

Out[ ]= 2131

Out[ ]= 1635

Out[ ]= 4424

Out[ ]= 2

Out[ ]= $\left\{\left\{-\pi, \frac{2131}{6555}\right\}, \left\{-2.51327, \frac{660}{2023}\right\}, \left\{-1.88496, \frac{1643}{4603}\right\},\right.$
$\left\{-1.25664, \frac{1235}{2927}\right\}, \left\{-0.628319, \frac{901}{1550}\right\}, \left\{0., \frac{728}{977}\right\}, \left\{0.628319, \frac{167}{302}\right\},$
$\left.\left\{1.25664, \frac{607}{1447}\right\}, \left\{1.88496, \frac{1627}{4669}\right\}, \left\{2.51327, \frac{1979}{6016}\right\}, \left\{\pi, \frac{2131}{6555}\right\}\right\}$

Out[ ]= $\left\{\left\{-\pi, \frac{6555}{8192}\right\}, \left\{-2.51327, \frac{6069}{8192}\right\}, \left\{-1.88496, \frac{4603}{8192}\right\},\right.$
$\left\{-1.25664, \frac{2927}{8192}\right\}, \left\{-0.628319, \frac{775}{4096}\right\}, \left\{0., \frac{977}{8192}\right\}, \left\{0.628319, \frac{755}{4096}\right\},$
$\left.\left\{1.25664, \frac{1447}{4096}\right\}, \left\{1.88496, \frac{4669}{8192}\right\}, \left\{2.51327, \frac{47}{64}\right\}, \left\{3.14159, \frac{6555}{8192}\right\}\right\}$

Out[ ]=
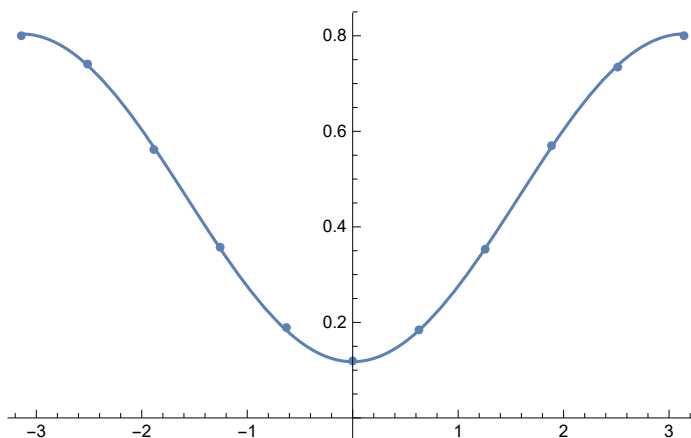
Out[ ]=
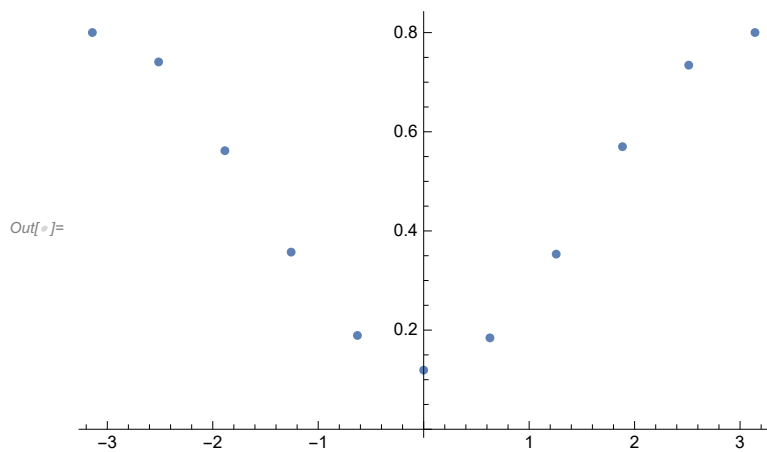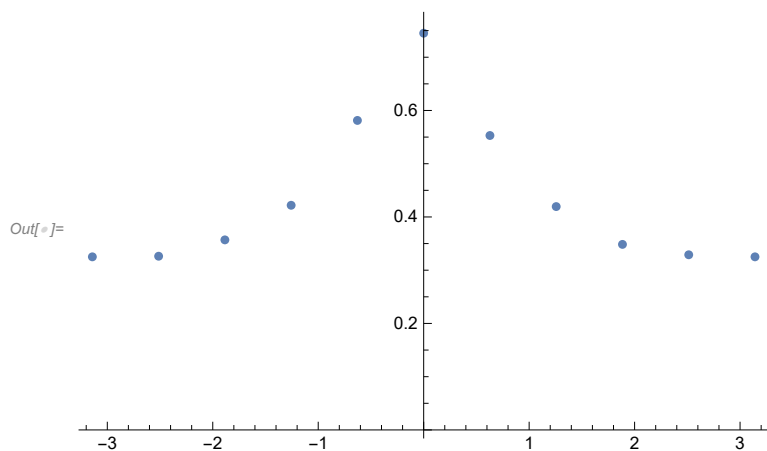
In[ ]:= **Show[cosTH, ExpCosSqibmqqasmsimulator]**

Out[ ]=
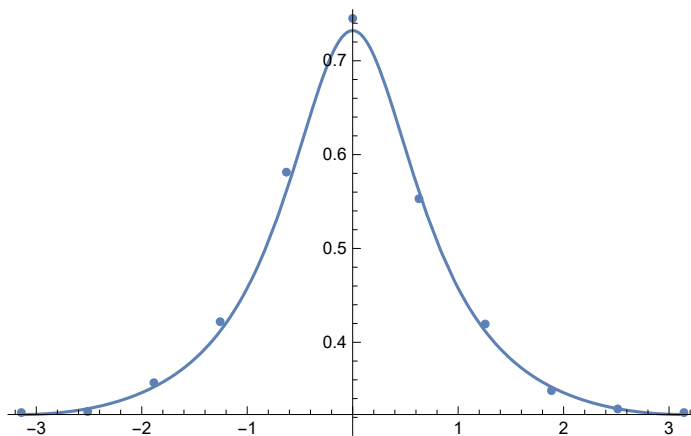
In[ ]:= **Show[decTH, ExpDecisivenessibmqqasmsimulator]**

Out[ ]=

In[ ]:= **(*ibmq_belem*)**
ZeroZeroFirst10ibmqbelem = 2513
ZeroOneFirst10ibmqbelem = 1780
OneZeroFirst10ibmqbelem = 3563
OneOneFirst10ibmqbelem = 336

ZeroZeroFirst08ibmqbelem = 2160
ZeroOneFirst08ibmqbelem = 1960
OneZeroFirst08ibmqbelem = 3583
OneOneFirst08ibmqbelem = 489

ZeroZeroFirst06ibmqbelem = 1689
ZeroOneFirst06ibmqbelem = 2836
OneZeroFirst06ibmqbelem = 2890
OneOneFirst06ibmqbelem = 777

ZeroZeroFirst04ibmqbelem = 1222
ZeroOneFirst04ibmqbelem = 3905
OneZeroFirst04ibmqbelem = 1969
OneOneFirst04ibmqbelem = 1096

```
ZeroZeroFirst02ibmqbelem = 963
ZeroOneFirst02ibmqbelem = 4825
OneZeroFirst02ibmqbelem = 1159
OneOneFirst02ibmqbelem = 1245


ZeroZeroFirst00ibmqbelem = 1086
ZeroOneFirst00ibmqbelem = 5305
OneZeroFirst00ibmqbelem = 621
OneOneFirst00ibmqbelem = 1180


ZeroZeroSecond02ibmqbelem = 1324
ZeroOneSecond02ibmqbelem = 5039
OneZeroSecond02ibmqbelem = 789
OneOneSecond02ibmqbelem = 1040


ZeroZeroSecond04ibmqbelem = 1681
ZeroOneSecond04ibmqbelem = 4300
OneZeroSecond04ibmqbelem = 1395
OneOneSecond04ibmqbelem = 816


ZeroZeroSecond06ibmqbelem = 2206
ZeroOneSecond06ibmqbelem = 3208
OneZeroSecond06ibmqbelem = 2250
OneOneSecond06ibmqbelem = 528


ZeroZeroSecond08ibmqbelem = 2399
ZeroOneSecond08ibmqbelem = 2268
OneZeroSecond08ibmqbelem = 3168
OneOneSecond08ibmqbelem = 357


ZeroZeroSecond10ibmqbelem = 2513
ZeroOneSecond10ibmqbelem = 1780
OneZeroSecond10ibmqbelem = 3563
OneOneSecond10ibmqbelem = 336


CosSqibmqbelem = {{-1 * π,
    ZeroZeroSecond10ibmqbelem / (OneZeroSecond10ibmqbelem + ZeroZeroSecond10ibmqbelem)},
  {-0.8 * π, ZeroZeroSecond08ibmqbelem /
     (OneZeroSecond08ibmqbelem + ZeroZeroSecond08ibmqbelem)}, {-0.6 * π,
    ZeroZeroSecond06ibmqbelem / (OneZeroSecond06ibmqbelem + ZeroZeroSecond06ibmqbelem)},
  {-0.4 * π, ZeroZeroSecond04ibmqbelem /
     (OneZeroSecond04ibmqbelem + ZeroZeroSecond04ibmqbelem)}, {-0.2 * π,
    ZeroZeroSecond02ibmqbelem / (OneZeroSecond02ibmqbelem + ZeroZeroSecond02ibmqbelem)},
  {0.0 * π, ZeroZeroFirst00ibmqbelem / (OneZeroFirst00ibmqbelem + ZeroZeroFirst00ibmqbelem)},
  {0.2 * π, ZeroZeroFirst02ibmqbelem / (OneZeroFirst02ibmqbelem + ZeroZeroFirst02ibmqbelem)},
  {0.4 * π, ZeroZeroFirst04ibmqbelem / (OneZeroFirst04ibmqbelem + ZeroZeroFirst04ibmqbelem)},
  {0.6 * π, ZeroZeroFirst06ibmqbelem / (OneZeroFirst06ibmqbelem + ZeroZeroFirst06ibmqbelem)},
  {0.8 * π, ZeroZeroFirst08ibmqbelem / (OneZeroFirst08ibmqbelem + ZeroZeroFirst08ibmqbelem)},
  {1 * π, ZeroZeroFirst10ibmqbelem / (OneZeroFirst10ibmqbelem + ZeroZeroFirst10ibmqbelem)}}}
Decisivenessibmqbelem =
```

```
{{-1 * π, (OneZeroSecond10ibmqbelem + ZeroZeroSecond10ibmqbelem) / 8192},
 {-0.8 * π, (OneZeroSecond08ibmqbelem + ZeroZeroSecond08ibmqbelem) / 8192},
 {-0.6 * π, (OneZeroSecond06ibmqbelem + ZeroZeroSecond06ibmqbelem) / 8192},
 {-0.4 * π, (OneZeroSecond04ibmqbelem + ZeroZeroSecond04ibmqbelem) / 8192},
 {-0.2 * π, (OneZeroSecond02ibmqbelem + ZeroZeroSecond02ibmqbelem) / 8192},
 {-0.0 * π, (OneZeroFirst00ibmqbelem + ZeroZeroFirst00ibmqbelem) / 8192},
 {0.2 * π, (OneZeroFirst02ibmqbelem + ZeroZeroFirst02ibmqbelem) / 8192},
 {0.4 * π, (OneZeroFirst04ibmqbelem + ZeroZeroFirst04ibmqbelem) / 8192},
 {0.6 * π, (OneZeroFirst06ibmqbelem + ZeroZeroFirst06ibmqbelem) / 8192},
 {0.8 * π, (OneZeroFirst08ibmqbelem + ZeroZeroFirst08ibmqbelem) / 8192},
 {1.0 * π, (OneZeroFirst10ibmqbelem + ZeroZeroFirst10ibmqbelem) / 8192}}
ExpCosSqibmqbelem = ListPlot[CosSqibmqbelem]
ExpDecisivenessibmqbelem = ListPlot[Decisivenessibmqbelem]
```

Out[●]= 2513

Out[●]= 1780

Out[●]= 3563

Out[●]= 336

Out[●]= 2160

Out[●]= 1960

Out[●]= 3583

Out[●]= 489

Out[●]= 1689

Out[●]= 2836

Out[●]= 2890

Out[●]= 777

Out[●]= 1222

Out[●]= 3905

Out[●]= 1969

Out[●]= 1096

Out[●]= 963

Out[●]= 4825

Out[●]= 1159

Out[●]= 1245

Out[●]= 1086

Out[●]= 5305

Out[●]= 621

Out[●]= 1180

Out[●]= 1324

Out[●]= 5039

Out[●]= 789

Out[●]= 1040

Out[●]= 1681

Out[●]= 4300

Out[●]= 1395

Out[●]= 816

Out[●]= 2206

Out[●]= 3208

Out[●]= 2250

Out[●]= 528

Out[●]= 2399

Out[●]= 2268

Out[●]= 3168

Out[●]= 357

Out[●]= 2513

Out[●]= 1780

Out[●]= 3563

Out[●]= 336

Out[●]= $\left\{\left\{-\pi, \frac{359}{868}\right\}, \left\{-2.51327, \frac{2399}{5567}\right\}, \left\{-1.88496, \frac{1103}{2228}\right\},\right.$
$\left\{-1.25664, \frac{1681}{3076}\right\}, \left\{-0.628319, \frac{1324}{2113}\right\}, \left\{0., \frac{362}{569}\right\}, \left\{0.628319, \frac{963}{2122}\right\},$
$\left.\left\{1.25664, \frac{1222}{3191}\right\}, \left\{1.88496, \frac{1689}{4579}\right\}, \left\{2.51327, \frac{2160}{5743}\right\}, \left\{\pi, \frac{359}{868}\right\}\right\}$

Out[●]= $\left\{\left\{-\pi, \frac{1519}{2048}\right\}, \left\{-2.51327, \frac{5567}{8192}\right\}, \left\{-1.88496, \frac{557}{1024}\right\},\right.$
$\left\{-1.25664, \frac{769}{2048}\right\}, \left\{-0.628319, \frac{2113}{8192}\right\}, \left\{0., \frac{1707}{8192}\right\}, \left\{0.628319, \frac{1061}{4096}\right\},$
$\left.\left\{1.25664, \frac{3191}{8192}\right\}, \left\{1.88496, \frac{4579}{8192}\right\}, \left\{2.51327, \frac{5743}{8192}\right\}, \left\{3.14159, \frac{1519}{2048}\right\}\right\}$

Out[ ]=

Out[ ]=
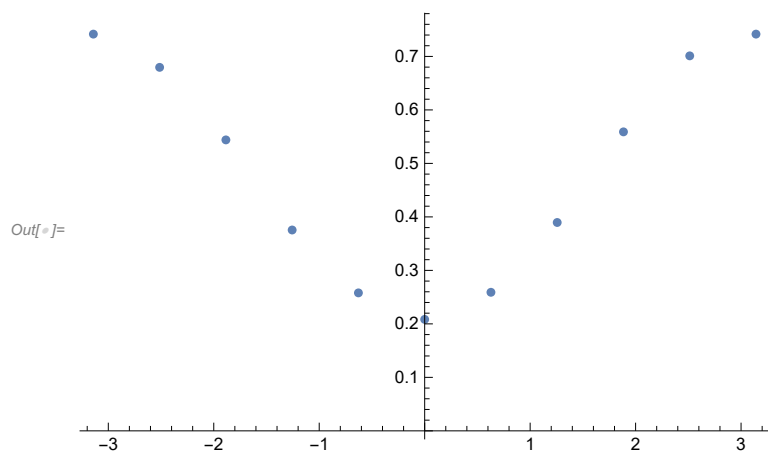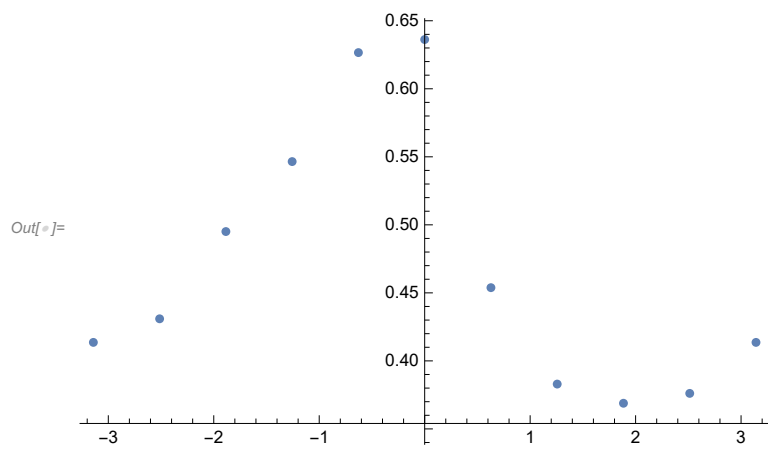
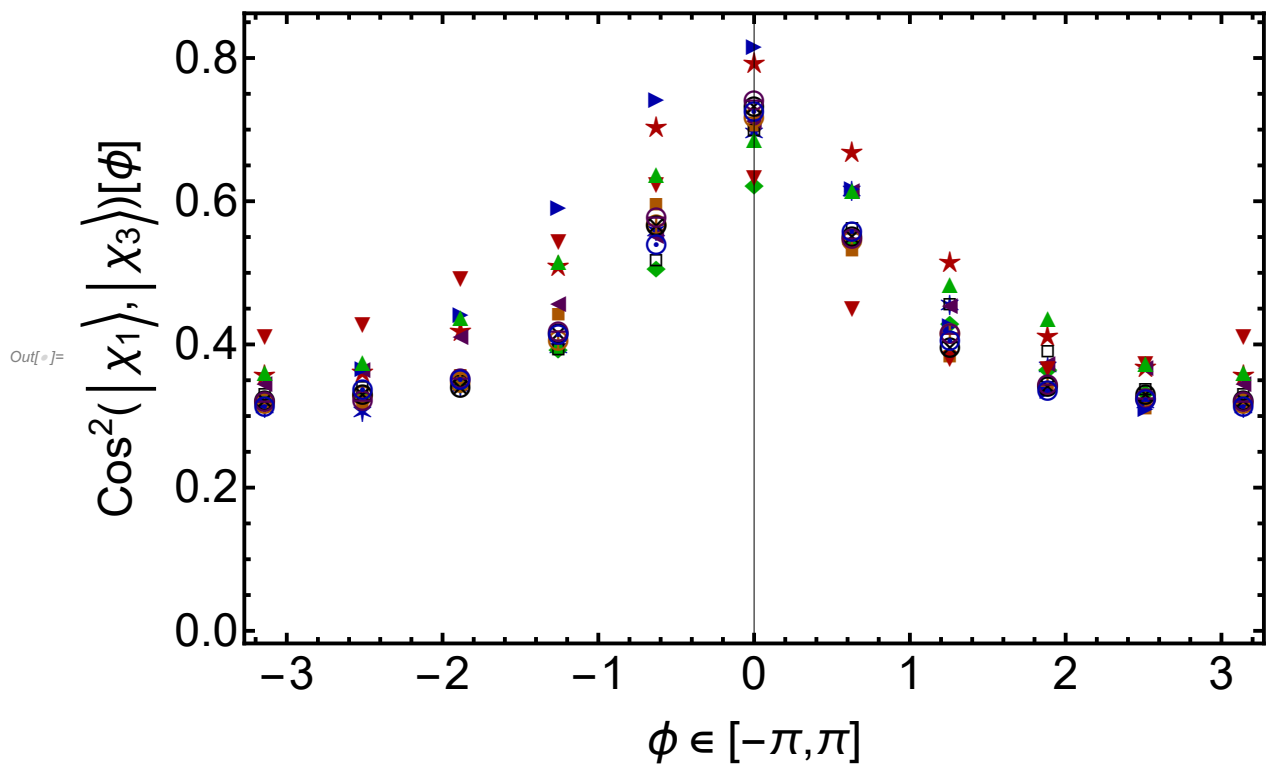In[ ]:= **Show[cosTH, ExpCosSqibmqbelem]**

Out[ ]=

In[ ]:= **Show[decTH, ExpDecisivenessibmqbelem]**

Out[ ]=
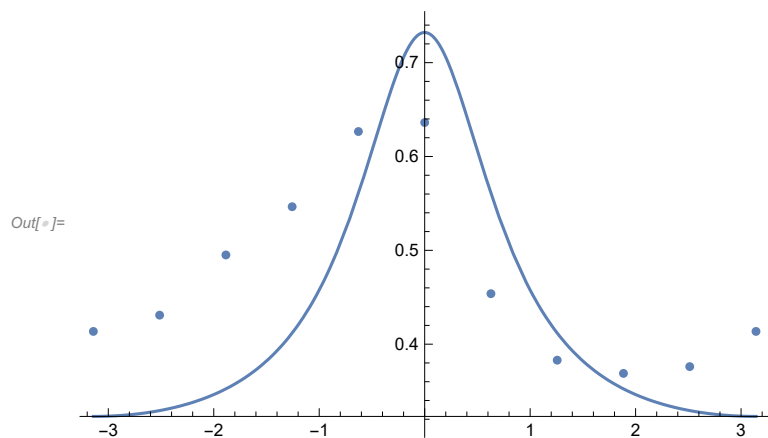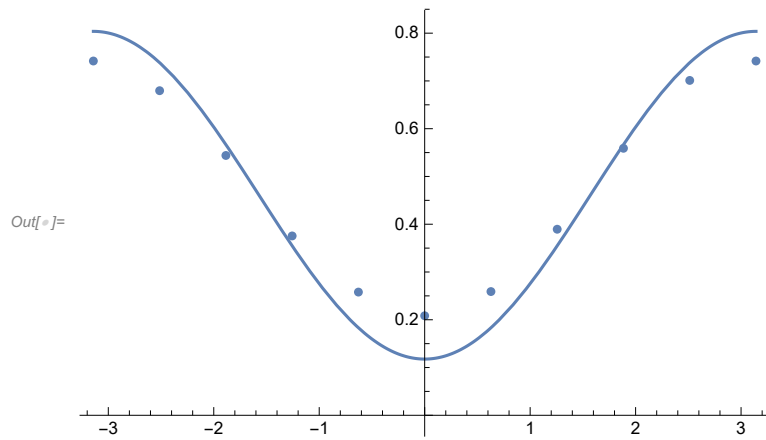
In[•]:= **CosSqExperiment =**
    ListPlot[{CosSqibmperth, CosSqibmqjakarta, CosSqibmlagos, CosSqibmnairobi, CosSqibmoslo,
     CosSqibmqmanila, CosSqibmqquito, CosSqibmqbelem, CosSqibmqlima, CosSqsimulatormps,
     CosSqsimulatorextendedstabilizer, CosSqibmqqasmsimulator, CosSqsimulatorstatevector},
    PlotStyle → {Directive[Darker[Blue], Thickness[0.007]],
     Directive[Darker[Red], Dashing[0.02], Thickness[0.007]],
     Directive[Darker[Green], Thickness[0.005], Dotted],
     Directive[Darker[Orange], Thickness[0.007], Dashed], Directive[Darker[Black],
      Thickness[0.003]], Directive[Cross, Darker[Purple], Thickness[0.003]]},
    Frame → True, FrameStyle → Directive[Black, Thick], Frame → True,
    FrameStyle → Directive[Black, Thick], LabelStyle → Large,
    PlotStyle → {Directive[Darker[Green], Thickness[0.007]]},
    FrameLabel → {{"Cos²(|χ₁⟩,|χ₃⟩)[ϕ]",}, {"ϕ ∈ [-π,π]", ""}},
    LabelStyle → {FontWeight → "Bold", FontSize → 25},
    ImageSize → 650, GridLinesStyle → Directive[Thick, Gray],
    PlotMarkers -> {{"★", 15}, {"⋆", 15}, {"◆", 15}, {"■", 15}, {"□", 15}, {"◄", 15},
     {"►", 15}, {"▼", 15}, {"▲", 15}, {"⊕", 15}, {"⊗", 15}, {"⊖", 15}, {"⊙", 15}}]

Out[•]=

In[ ]:= `CossqTheory = Plot[1 - N[cosSecondFunction[-x, 4 / 5, π / 2 - 1, 1]], {x, -π, π},`
`PlotRange → All, PlotStyle → {Directive[Darker[Blue], Thickness[0.003]]},`
`Frame → True, FrameStyle → Directive[Black, Thick], Frame → True,`
`FrameStyle → Directive[Black, Thick], LabelStyle → Large,`
`PlotStyle → {Directive[Darker[Green], Thickness[0.007]]},`
`FrameLabel → {{"Cos²(|χ₁⟩, |χ₃⟩)[φ]",}, {"φ ∈ [-π,π]", ""}},`
`LabelStyle → {FontWeight → "Bold", FontSize → 25},`
`ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]`

Out[ ]=
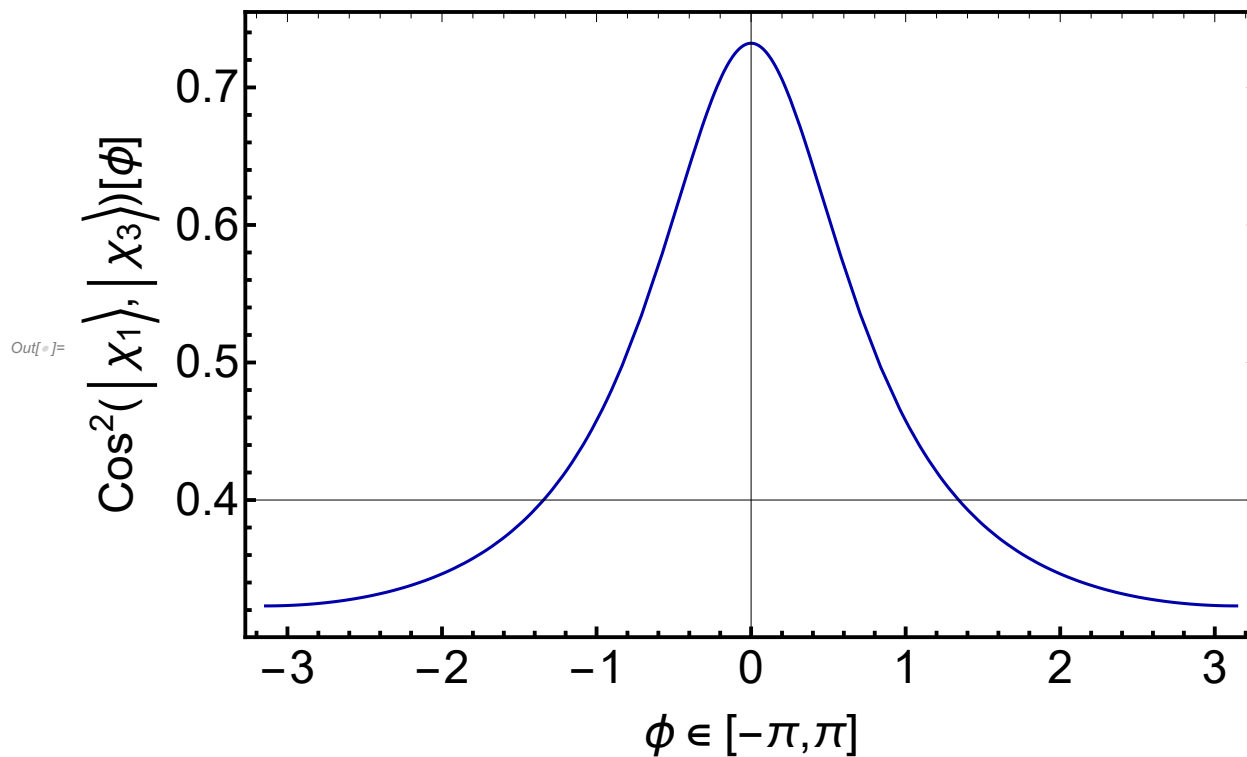
In[ ]:= **p1 = Show[CosSqTheory, CosSqExperiment, PlotRange → All]**

Out[ ]=
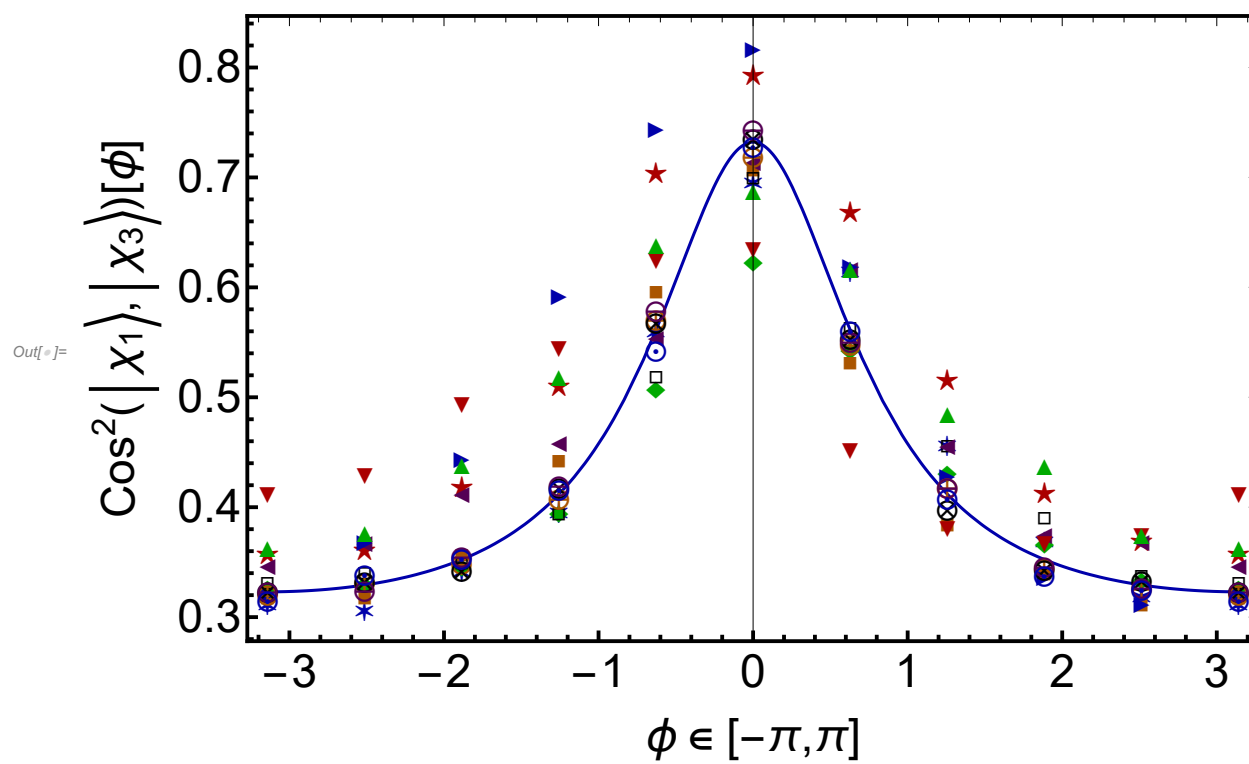
In[●]:= `DecisivenessTheory = Plot[DecisivenessSecondFunction[-x, 4 / 5, π / 2 - 1, 3], {x, -π, π},`
    `PlotRange → All, PlotStyle → {Directive[Darker[Red], Dashing[0.02], Thickness[0.003]]},`
    `Frame → True, FrameStyle → Directive[Black, Thick], Frame → True,`
    `FrameStyle → Directive[Black, Thick], LabelStyle → Large,`
    `PlotStyle → {Directive[Darker[Green], Thickness[0.007]]}, FrameLabel →`
    $\left\{\left\{\text{"Population of postselected space, \n } \frac{\langle\psi_{\mathcal{PT}} \mid \psi_{\mathcal{PT}}\rangle}{\langle\psi_{\mathcal{PT}} \mid \psi_{\mathcal{PT}}\rangle + \langle\psi_{\mathcal{PT}} \mid \xi^2 \mid \psi_{\mathcal{PT}}\rangle}[\phi]\text{",}\right\}\right.$,
    `{"φ ∈ [-π,π]", ""}}, LabelStyle → {FontWeight → "Bold", FontSize → 25},`
    `ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]`

Out[●]=

```
In[ ]:= DecisivenessExperiment =
    ListPlot[{Decisivenessibmperth, Decisivenessibmqjakarta, Decisivenessibmlagos,
      Decisivenessibmnairobi, Decisivenessibmoslo, Decisivenessibmqmanila,
      Decisivenessibmqquito, Decisivenessibmqbelem, Decisivenessibmqlima,
      Decisivenesssimulatormps, Decisivenesssimulatorextendedstabilizer,
      Decisivenessibmqqasmsimulator, Decisivenesssimulatorstatevector},
     PlotStyle → {Directive[Darker[Blue], Thickness[0.007]],
       Directive[Darker[Red], Dashing[0.02], Thickness[0.007]],
       Directive[Darker[Green], Thickness[0.005], Dotted], Directive[Darker[Orange],
        Thickness[0.007], Dashed], Directive[Darker[Black], Thickness[0.003]],
       Directive[Cross, Darker[Purple], Thickness[0.003]]}, Frame → True,
     FrameStyle → Directive[Black, Thick], PlotLegends → LineLegend[{"ibm_perth",
        "ibmq_jakarta", "ibm_lagos", "ibm_nairobi", "ibm_oslo", "ibmq_manila", "ibmq_quito",
        "ibmq_belem", "ibmq_lima", "simulator_mps", "simulator_extended_stabilizer",
        "ibmq_qasm_simulator", "simulator_statevector"}, LegendFunction → Framed],
     Frame → True, FrameStyle → Directive[Black, Thick], LabelStyle → Large,
     PlotStyle → {Directive[Darker[Green], Thickness[0.007]]},
     FrameLabel → {{"$\frac{\langle\psi_{\mathcal{PT}}\,|\,\psi_{\mathcal{PT}}\rangle}{\langle\psi_{\mathcal{PT}}\,|\,\psi_{\mathcal{PT}}\rangle+\langle\psi_{\mathcal{PT}}\,|\,\xi^2\,|\,\psi_{\mathcal{PT}}\rangle}[x]$",}, {"$\phi\in[-\pi,\pi]$", ""}},
     LabelStyle → {FontWeight → "Bold", FontSize → 25},
     ImageSize → 650, GridLinesStyle → Directive[Thick, Gray],
     PlotMarkers -> {{"★", 15}, {"☆", 15}, {"◆", 15}, {"■", 15}, {"□", 15}, {"◀", 15},
       {"▶", 15}, {"▼", 15}, {"▲", 15}, {"⊕", 15}, {"⊗", 15}, {"⊖", 15}, {"⊙", 15}}]
```
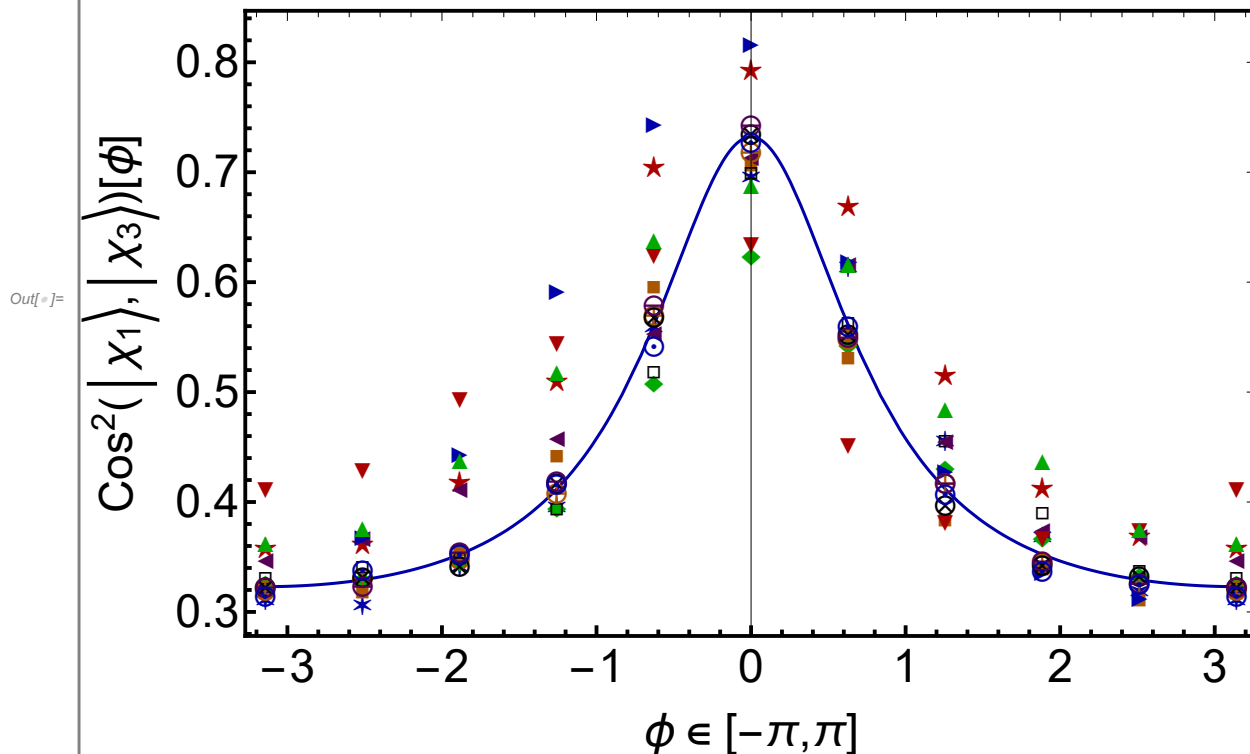
In[ ]:= `p2 = Show[DecisivenessExperiment, DecisivenessTheory, PlotRange -> All]`

Out[ ]=
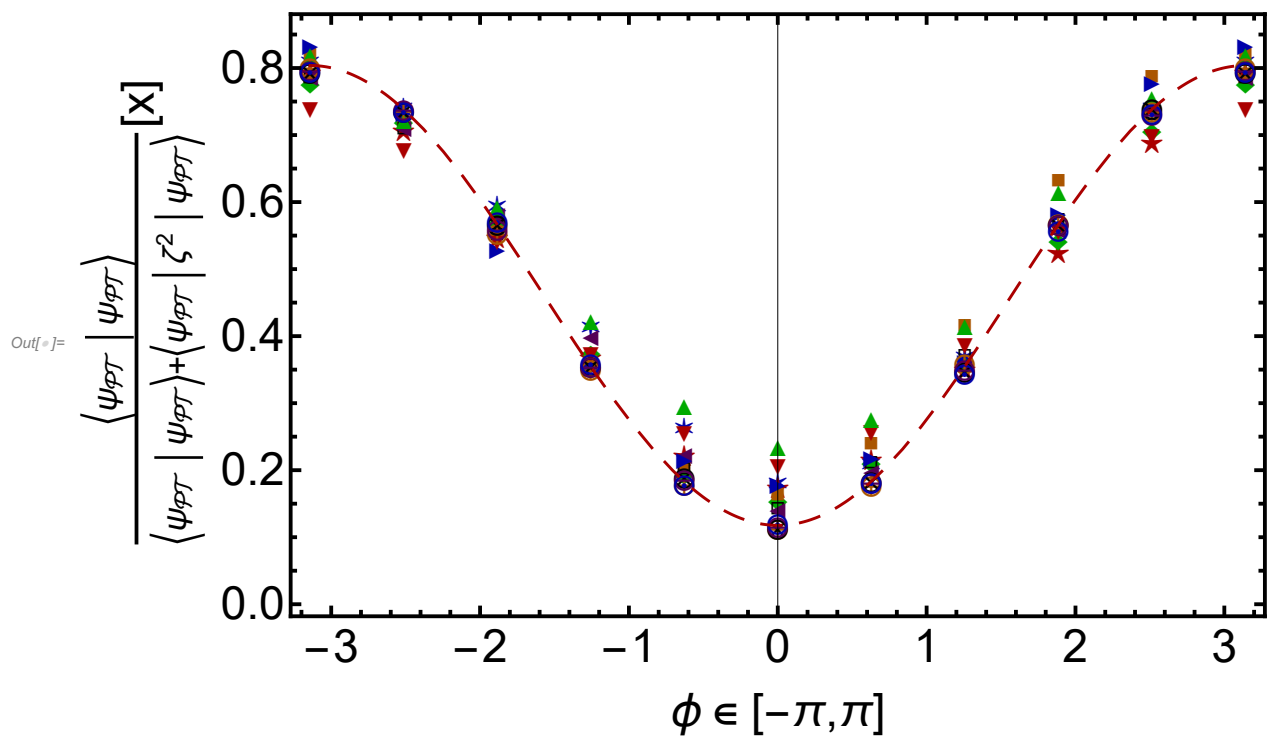
```
In[•]:= title = Panel[Style["First stage, σ = 4/5, Δ = σ/2, α = π/2 - 1, 𝒩(0) ≈ 𝒩_min", White, 20],
        ImageSize → 500, Background → Blue, Alignment → Center];
    DependenceVariation = Deploy@Grid[{{title, SpanFromLeft}, {p1, p2}},
        Dividers → Gray, Spacings → {0, 0}]
```

Out[•]=


```
In[•]:= Export["First45Two_8_9_2023.png", DependenceVariation, ImageSize → 10000]
```

Out[•]= First45Two_8_9_2023.png

```
In[•]:= (*ibm_perth*)
    ZeroZeroFirst10ibmperth = 2069
    ZeroOneFirst10ibmperth = 1205
    OneZeroFirst10ibmperth = 4570
    OneOneFirst10ibmperth = 348

    ZeroZeroFirst08ibmperth = 1939
    ZeroOneFirst08ibmperth = 1644
    OneZeroFirst08ibmperth = 4133
    OneOneFirst08ibmperth = 476

    ZeroZeroFirst06ibmperth = 1693
    ZeroOneFirst06ibmperth = 2785
    OneZeroFirst06ibmperth = 2894
```

```
OneOneFirst06ibmperth = 820

ZeroZeroFirst04ibmperth = 1383
ZeroOneFirst04ibmperth = 3923
OneZeroFirst04ibmperth = 1651
OneOneFirst04ibmperth = 1235

ZeroZeroFirst02ibmperth = 1062
ZeroOneFirst02ibmperth = 4992
OneZeroFirst02ibmperth = 666
OneOneFirst02ibmperth = 1472

ZeroZeroFirst00ibmperth = 1039
ZeroOneFirst00ibmperth = 5131
OneZeroFirst00ibmperth = 454
OneOneFirst00ibmperth = 1568

ZeroZeroSecond02ibmperth = 1209
ZeroOneSecond02ibmperth = 4660
OneZeroSecond02ibmperth = 951
OneOneSecond02ibmperth = 1372

ZeroZeroSecond04ibmperth = 1342
ZeroOneSecond04ibmperth = 3704
OneZeroSecond04ibmperth = 2050
OneOneSecond04ibmperth = 1096

ZeroZeroSecond06ibmperth = 1667
ZeroOneSecond06ibmperth = 2567
OneZeroSecond06ibmperth = 3213
OneOneSecond06ibmperth = 745

ZeroZeroSecond08ibmperth = 1863
ZeroOneSecond08ibmperth = 1675
OneZeroSecond08ibmperth = 4214
OneOneSecond08ibmperth = 440

ZeroZeroSecond10ibmperth = 2069
ZeroOneSecond10ibmperth = 1205
OneZeroSecond10ibmperth = 4570
OneOneSecond10ibmperth = 348

CosSqibmperth =
  {{-1 * π, ZeroZeroSecond10ibmperth / (OneZeroSecond10ibmperth + ZeroZeroSecond10ibmperth)},
   {-0.8 * π, ZeroZeroSecond08ibmperth /
      (OneZeroSecond08ibmperth + ZeroZeroSecond08ibmperth)}, {-0.6 * π,
    ZeroZeroSecond06ibmperth / (OneZeroSecond06ibmperth + ZeroZeroSecond06ibmperth)},
   {-0.4 * π, ZeroZeroSecond04ibmperth /
      (OneZeroSecond04ibmperth + ZeroZeroSecond04ibmperth)}, {-0.2 * π,
    ZeroZeroSecond02ibmperth / (OneZeroSecond02ibmperth + ZeroZeroSecond02ibmperth)},
   {0.0 * π, ZeroZeroFirst00ibmperth / (OneZeroFirst00ibmperth + ZeroZeroFirst00ibmperth)},
```

```
        {0.2 * π, ZeroZeroFirst02ibmperth / (OneZeroFirst02ibmperth + ZeroZeroFirst02ibmperth)},
        {0.4 * π, ZeroZeroFirst04ibmperth / (OneZeroFirst04ibmperth + ZeroZeroFirst04ibmperth)},
        {0.6 * π, ZeroZeroFirst06ibmperth / (OneZeroFirst06ibmperth + ZeroZeroFirst06ibmperth)},
        {0.8 * π, ZeroZeroFirst08ibmperth / (OneZeroFirst08ibmperth + ZeroZeroFirst08ibmperth)},
        {1 * π, ZeroZeroFirst10ibmperth / (OneZeroFirst10ibmperth + ZeroZeroFirst10ibmperth)}}
Decisivenessibmperth =
 {{-1 * π, (OneZeroSecond10ibmperth + ZeroZeroSecond10ibmperth) / 8192},
  {-0.8 * π, (OneZeroSecond08ibmperth + ZeroZeroSecond08ibmperth) / 8192},
  {-0.6 * π, (OneZeroSecond06ibmperth + ZeroZeroSecond06ibmperth) / 8192},
  {-0.4 * π, (OneZeroSecond04ibmperth + ZeroZeroSecond04ibmperth) / 8192},
  {-0.2 * π, (OneZeroSecond02ibmperth + ZeroZeroSecond02ibmperth) / 8192},
  {-0.0 * π, (OneZeroFirst00ibmperth + ZeroZeroFirst00ibmperth) / 8192},
  {0.2 * π, (OneZeroFirst02ibmperth + ZeroZeroFirst02ibmperth) / 8192},
  {0.4 * π, (OneZeroFirst04ibmperth + ZeroZeroFirst04ibmperth) / 8192},
  {0.6 * π, (OneZeroFirst06ibmperth + ZeroZeroFirst06ibmperth) / 8192},
  {0.8 * π, (OneZeroFirst08ibmperth + ZeroZeroFirst08ibmperth) / 8192},
  {1.0 * π, (OneZeroFirst10ibmperth + ZeroZeroFirst10ibmperth) / 8192}}
ExpCosSqibmperth = ListPlot[CosSqibmperth]
ExpDecisivenessibmperth = ListPlot[Decisivenessibmperth]
Show[cosTH, ExpCosSqibmperth, PlotRange → All]
Show[decTH, ExpDecisivenessibmperth]




(*ibmq_jakarta*)
ZeroZeroFirst10ibmqjakarta = 2331
ZeroOneFirst10ibmqjakarta = 1431
OneZeroFirst10ibmqjakarta = 4173
OneOneFirst10ibmqjakarta = 257

ZeroZeroFirst08ibmqjakarta = 2090
ZeroOneFirst08ibmqjakarta = 1991
OneZeroFirst08ibmqjakarta = 3560
OneOneFirst08ibmqjakarta = 551

ZeroZeroFirst06ibmqjakarta = 1779
ZeroOneFirst06ibmqjakarta = 3173
OneZeroFirst06ibmqjakarta = 2526
OneOneFirst06ibmqjakarta = 714

ZeroZeroFirst04ibmqjakarta = 1484
ZeroOneFirst04ibmqjakarta = 4320
OneZeroFirst04ibmqjakarta = 1390
OneOneFirst04ibmqjakarta = 998

ZeroZeroFirst02ibmqjakarta = 1183
ZeroOneFirst02ibmqjakarta = 5312
OneZeroFirst02ibmqjakarta = 584
OneOneFirst02ibmqjakarta = 1113
```

```
ZeroZeroFirst00ibmqjakarta = 1137
ZeroOneFirst00ibmqjakarta = 5620
OneZeroFirst00ibmqjakarta = 296
OneOneFirst00ibmqjakarta = 1139

ZeroZeroSecond02ibmqjakarta = 1283
ZeroOneSecond02ibmqjakarta = 5306
OneZeroSecond02ibmqjakarta = 537
OneOneSecond02ibmqjakarta = 1066

ZeroZeroSecond04ibmqjakarta = 1540
ZeroOneSecond04ibmqjakarta = 4324
OneZeroSecond04ibmqjakarta = 1475
OneOneSecond04ibmqjakarta = 853

ZeroZeroSecond06ibmqjakarta = 1879
ZeroOneSecond06ibmqjakarta = 3094
OneZeroSecond06ibmqjakarta = 2603
OneOneSecond06ibmqjakarta = 616

ZeroZeroSecond08ibmqjakarta = 2099
ZeroOneSecond08ibmqjakarta = 1999
OneZeroSecond08ibmqjakarta = 3699
OneOneSecond08ibmqjakarta = 395

ZeroZeroSecond10ibmqjakarta = 2331
ZeroOneSecond10ibmqjakarta = 1431
OneZeroSecond10ibmqjakarta = 4173
OneOneSecond10ibmqjakarta = 257
```

$$CosSqibmqjakarta = \{\{-1 * \pi, ZeroZeroSecond10ibmqjakarta /$$
$$(OneZeroSecond10ibmqjakarta + ZeroZeroSecond10ibmqjakarta)\},$$
$$\{-0.8 * \pi, ZeroZeroSecond08ibmqjakarta /$$
$$(OneZeroSecond08ibmqjakarta + ZeroZeroSecond08ibmqjakarta)\},$$
$$\{-0.6 * \pi, ZeroZeroSecond06ibmqjakarta / (OneZeroSecond06ibmqjakarta +$$
$$ZeroZeroSecond06ibmqjakarta)\}, \{-0.4 * \pi, ZeroZeroSecond04ibmqjakarta /$$
$$(OneZeroSecond04ibmqjakarta + ZeroZeroSecond04ibmqjakarta)\},$$
$$\{-0.2 * \pi, ZeroZeroSecond02ibmqjakarta /$$
$$(OneZeroSecond02ibmqjakarta + ZeroZeroSecond02ibmqjakarta)\}, \{0.0 * \pi,$$
$$ZeroZeroFirst00ibmqjakarta / (OneZeroFirst00ibmqjakarta + ZeroZeroFirst00ibmqjakarta)\},$$
$$\{0.2 * \pi, ZeroZeroFirst02ibmqjakarta /$$
$$(OneZeroFirst02ibmqjakarta + ZeroZeroFirst02ibmqjakarta)\}, \{0.4 * \pi,$$
$$ZeroZeroFirst04ibmqjakarta / (OneZeroFirst04ibmqjakarta + ZeroZeroFirst04ibmqjakarta)\},$$
$$\{0.6 * \pi, ZeroZeroFirst06ibmqjakarta /$$
$$(OneZeroFirst06ibmqjakarta + ZeroZeroFirst06ibmqjakarta)\}, \{0.8 * \pi,$$
$$ZeroZeroFirst08ibmqjakarta / (OneZeroFirst08ibmqjakarta + ZeroZeroFirst08ibmqjakarta)\},$$
$$\{1 * \pi, ZeroZeroFirst10ibmqjakarta /$$
$$(OneZeroFirst10ibmqjakarta + ZeroZeroFirst10ibmqjakarta)\}\}$$
$$Decisivenessibmqjakarta = \{\{-1 * \pi,$$

```
   (OneZeroSecond10ibmqjakarta + ZeroZeroSecond10ibmqjakarta) / 8192},
  {-0.8 * π, (OneZeroSecond08ibmqjakarta + ZeroZeroSecond08ibmqjakarta) / 8192},
  {-0.6 * π, (OneZeroSecond06ibmqjakarta + ZeroZeroSecond06ibmqjakarta) / 8192},
  {-0.4 * π, (OneZeroSecond04ibmqjakarta + ZeroZeroSecond04ibmqjakarta) / 8192},
  {-0.2 * π, (OneZeroSecond02ibmqjakarta + ZeroZeroSecond02ibmqjakarta) / 8192},
  {-0.0 * π, (OneZeroFirst00ibmqjakarta + ZeroZeroFirst00ibmqjakarta) / 8192},
  {0.2 * π, (OneZeroFirst02ibmqjakarta + ZeroZeroFirst02ibmqjakarta) / 8192},
  {0.4 * π, (OneZeroFirst04ibmqjakarta + ZeroZeroFirst04ibmqjakarta) / 8192},
  {0.6 * π, (OneZeroFirst06ibmqjakarta + ZeroZeroFirst06ibmqjakarta) / 8192},
  {0.8 * π, (OneZeroFirst08ibmqjakarta + ZeroZeroFirst08ibmqjakarta) / 8192},
  {1.0 * π, (OneZeroFirst10ibmqjakarta + ZeroZeroFirst10ibmqjakarta) / 8192}}
ExpCosSqibmqjakarta = ListPlot[CosSqibmqjakarta]
ExpDecisivenessibmqjakarta = ListPlot[Decisivenessibmqjakarta]
Show[cosTH, ExpCosSqibmqjakarta, PlotRange → All]
Show[decTH, ExpDecisivenessibmqjakarta]


(*ibm_lagos*)
ZeroZeroFirst10ibmlagos = 2091
ZeroOneFirst10ibmlagos = 1671
OneZeroFirst10ibmlagos = 4290
OneOneFirst10ibmlagos = 140

ZeroZeroFirst08ibmlagos = 1947
ZeroOneFirst08ibmlagos = 2132
OneZeroFirst08ibmlagos = 3859
OneOneFirst08ibmlagos = 254

ZeroZeroFirst06ibmlagos = 1644
ZeroOneFirst06ibmlagos = 3159
OneZeroFirst06ibmlagos = 2818
OneOneFirst06ibmlagos = 571

ZeroZeroFirst04ibmlagos = 1273
ZeroOneFirst04ibmlagos = 4335
OneZeroFirst04ibmlagos = 1670
OneOneFirst04ibmlagos = 914

ZeroZeroFirst02ibmlagos = 949
ZeroOneFirst02ibmlagos = 5161
OneZeroFirst02ibmlagos = 794
OneOneFirst02ibmlagos = 1288

ZeroZeroFirst00ibmlagos = 800
ZeroOneFirst00ibmlagos = 5517
OneZeroFirst00ibmlagos = 480
OneOneFirst00ibmlagos = 1395

ZeroZeroSecond02ibmlagos = 818
```

```
ZeroOneSecond02ibmlagos = 5261
OneZeroSecond02ibmlagos = 788
OneOneSecond02ibmlagos = 1325

ZeroZeroSecond04ibmlagos = 1226
ZeroOneSecond04ibmlagos = 4140
OneZeroSecond04ibmlagos = 1870
OneOneSecond04ibmlagos = 956

ZeroZeroSecond06ibmlagos = 1622
ZeroOneSecond06ibmlagos = 2896
OneZeroSecond06ibmlagos = 3052
OneOneSecond06ibmlagos = 622

ZeroZeroSecond08ibmlagos = 1961
ZeroOneSecond08ibmlagos = 2009
OneZeroSecond08ibmlagos = 3950
OneOneSecond08ibmlagos = 272

ZeroZeroSecond10ibmlagos = 2091
ZeroOneSecond10ibmlagos = 1671
OneZeroSecond10ibmlagos = 4290
OneOneSecond10ibmlagos = 140

CosSqibmlagos =
  {{-1 * π, ZeroZeroSecond10ibmlagos / (OneZeroSecond10ibmlagos + ZeroZeroSecond10ibmlagos)},
   {-0.8 * π, ZeroZeroSecond08ibmlagos /
      (OneZeroSecond08ibmlagos + ZeroZeroSecond08ibmlagos)}, {-0.6 * π,
    ZeroZeroSecond06ibmlagos / (OneZeroSecond06ibmlagos + ZeroZeroSecond06ibmlagos)},
   {-0.4 * π, ZeroZeroSecond04ibmlagos /
      (OneZeroSecond04ibmlagos + ZeroZeroSecond04ibmlagos)}, {-0.2 * π,
    ZeroZeroSecond02ibmlagos / (OneZeroSecond02ibmlagos + ZeroZeroSecond02ibmlagos)},
   {0.0 * π, ZeroZeroFirst00ibmlagos / (OneZeroFirst00ibmlagos + ZeroZeroFirst00ibmlagos)},
   {0.2 * π, ZeroZeroFirst02ibmlagos / (OneZeroFirst02ibmlagos + ZeroZeroFirst02ibmlagos)},
   {0.4 * π, ZeroZeroFirst04ibmlagos / (OneZeroFirst04ibmlagos + ZeroZeroFirst04ibmlagos)},
   {0.6 * π, ZeroZeroFirst06ibmlagos / (OneZeroFirst06ibmlagos + ZeroZeroFirst06ibmlagos)},
   {0.8 * π, ZeroZeroFirst08ibmlagos / (OneZeroFirst08ibmlagos + ZeroZeroFirst08ibmlagos)},
   {1 * π, ZeroZeroFirst10ibmlagos / (OneZeroFirst10ibmlagos + ZeroZeroFirst10ibmlagos)}}
Decisivenessibmlagos =
  {{-1 * π, (OneZeroSecond10ibmlagos + ZeroZeroSecond10ibmlagos) / 8192},
   {-0.8 * π, (OneZeroSecond08ibmlagos + ZeroZeroSecond08ibmlagos) / 8192},
   {-0.6 * π, (OneZeroSecond06ibmlagos + ZeroZeroSecond06ibmlagos) / 8192},
   {-0.4 * π, (OneZeroSecond04ibmlagos + ZeroZeroSecond04ibmlagos) / 8192},
   {-0.2 * π, (OneZeroSecond02ibmlagos + ZeroZeroSecond02ibmlagos) / 8192},
   {-0.0 * π, (OneZeroFirst00ibmlagos + ZeroZeroFirst00ibmlagos) / 8192},
   {0.2 * π, (OneZeroFirst02ibmlagos + ZeroZeroFirst02ibmlagos) / 8192},
   {0.4 * π, (OneZeroFirst04ibmlagos + ZeroZeroFirst04ibmlagos) / 8192},
   {0.6 * π, (OneZeroFirst06ibmlagos + ZeroZeroFirst06ibmlagos) / 8192},
   {0.8 * π, (OneZeroFirst08ibmlagos + ZeroZeroFirst08ibmlagos) / 8192},
```

```
    {1.0 * π, (OneZeroFirst10ibmlagos + ZeroZeroFirst10ibmlagos) / 8192}}
ExpCosSqibmlagos = ListPlot[CosSqibmlagos]
ExpDecisivenessibmlagos = ListPlot[Decisivenessibmlagos]
Show[cosTH, ExpCosSqibmlagos, PlotRange → All]
Show[decTH, ExpDecisivenessibmlagos]
```

Out[●]= 2069

Out[●]= 1205

Out[●]= 4570

Out[●]= 348

Out[●]= 1939

Out[●]= 1644

Out[●]= 4133

Out[●]= 476

Out[●]= 1693

Out[●]= 2785

Out[●]= 2894

Out[●]= 820

Out[●]= 1383

Out[●]= 3923

Out[●]= 1651

Out[●]= 1235

Out[●]= 1062

Out[●]= 4992

Out[●]= 666

Out[●]= 1472

Out[●]= 1039

Out[●]= 5131

Out[●]= 454

Out[●]= 1568

Out[●]= 1209

Out[●]= 4660

Out[●]= 951

Out[●]= 1372

Out[●]= 1342

Out[●]= 3704

Out[●]= 2050

Out[●]= 1096

Out[●]= 1667

Out[●]= 2567

Out[●]= 3213

Out[●]= 745

Out[●]= 1863

Out[●]= 1675

Out[●]= 4214

Out[●]= 440

Out[●]= 2069

Out[●]= 1205

Out[●]= 4570

Out[●]= 348

Out[●]= $\left\{\left\{-\pi, \frac{2069}{6639}\right\}, \left\{-2.51327, \frac{1863}{6077}\right\}, \left\{-1.88496, \frac{1667}{4880}\right\},\right.$
$\left\{-1.25664, \frac{671}{1696}\right\}, \left\{-0.628319, \frac{403}{720}\right\}, \left\{0., \frac{1039}{1493}\right\}, \left\{0.628319, \frac{59}{96}\right\},$
$\left\{1.25664, \frac{1383}{3034}\right\}, \left\{1.88496, \frac{1693}{4587}\right\}, \left\{2.51327, \frac{1939}{6072}\right\}, \left\{\pi, \frac{2069}{6639}\right\}\left.\right\}$

Out[●]= $\left\{\left\{-\pi, \frac{6639}{8192}\right\}, \left\{-2.51327, \frac{6077}{8192}\right\}, \left\{-1.88496, \frac{305}{512}\right\},\right.$
$\left\{-1.25664, \frac{53}{128}\right\}, \left\{-0.628319, \frac{135}{512}\right\}, \left\{0., \frac{1493}{8192}\right\}, \left\{0.628319, \frac{27}{128}\right\},$
$\left\{1.25664, \frac{1517}{4096}\right\}, \left\{1.88496, \frac{4587}{8192}\right\}, \left\{2.51327, \frac{759}{1024}\right\}, \left\{3.14159, \frac{6639}{8192}\right\}\left.\right\}$

Out[ ]=

Out[ ]=

Out[ ]=

Out[ ]=
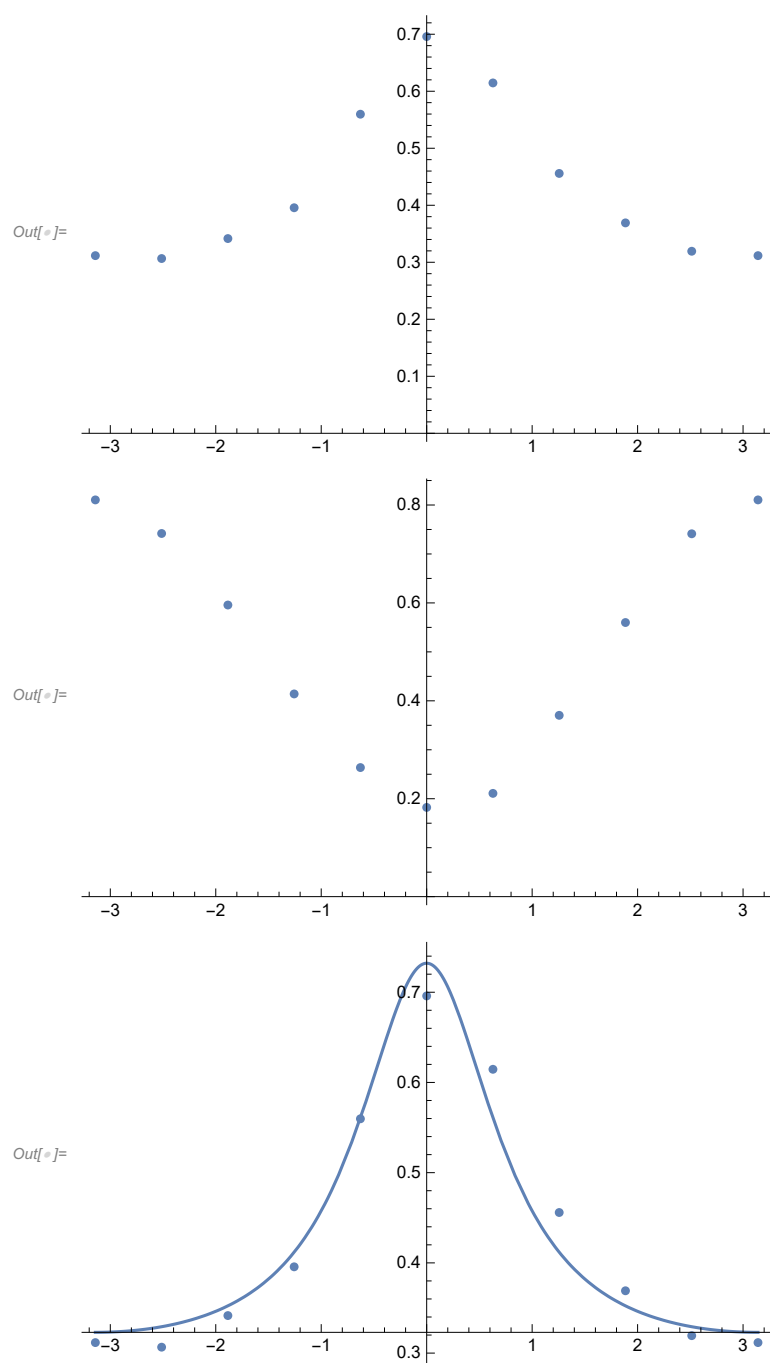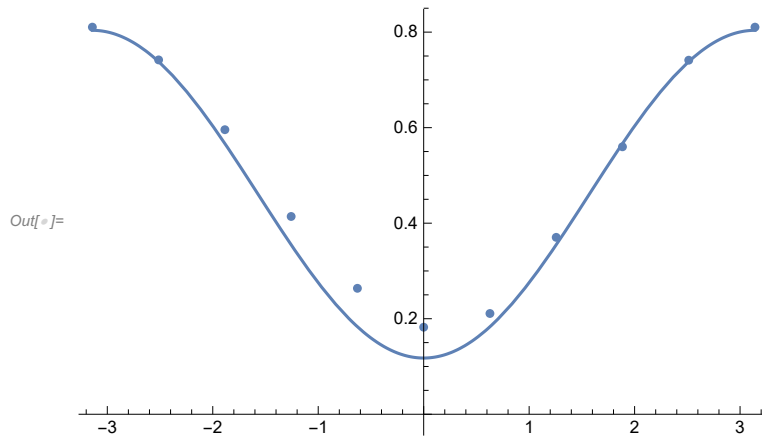
Out[ ]= 2331

Out[ ]= 1431

Out[ ]= 4173

Out[ ]= 257

Out[ ]= 2090

Out[ ]= 1991

Out[ ]= 3560

Out[ ]= 551

Out[ ]= 1779

Out[ ]= 3173

Out[ ]= 2526

Out[ ]= 714

Out[ ]= 1484

Out[ ]= 4320

Out[ ]= 1390

Out[ ]= 998

Out[ ]= 1183

Out[ ]= 5312

Out[ ]= 584

Out[ ]= 1113

Out[ ]= 1137

Out[ ]= 5620

Out[ ]= 296

Out[•]= 1139

Out[•]= 1283

Out[•]= 5306

Out[•]= 537

Out[•]= 1066

Out[•]= 1540

Out[•]= 4324

Out[•]= 1475

Out[•]= 853

Out[•]= 1879

Out[•]= 3094

Out[•]= 2603

Out[•]= 616

Out[•]= 2099

Out[•]= 1999

Out[•]= 3699

Out[•]= 395

Out[•]= 2331

Out[•]= 1431

Out[•]= 4173

Out[•]= 257

Out[•]= $\left\{\left\{-\pi, \frac{777}{2168}\right\}, \left\{-2.51327, \frac{2099}{5798}\right\}, \left\{-1.88496, \frac{1879}{4482}\right\},\right.$
$\left\{-1.25664, \frac{308}{603}\right\}, \left\{-0.628319, \frac{1283}{1820}\right\}, \left\{0., \frac{1137}{1433}\right\}, \left\{0.628319, \frac{1183}{1767}\right\},$
$\left.\left\{1.25664, \frac{742}{1437}\right\}, \left\{1.88496, \frac{593}{1435}\right\}, \left\{2.51327, \frac{209}{565}\right\}, \left\{\pi, \frac{777}{2168}\right\}\right\}$

Out[•]= $\left\{\left\{-\pi, \frac{813}{1024}\right\}, \left\{-2.51327, \frac{2899}{4096}\right\}, \left\{-1.88496, \frac{2241}{4096}\right\},\right.$
$\left\{-1.25664, \frac{3015}{8192}\right\}, \left\{-0.628319, \frac{455}{2048}\right\}, \left\{0., \frac{1433}{8192}\right\}, \left\{0.628319, \frac{1767}{8192}\right\},$
$\left.\left\{1.25664, \frac{1437}{4096}\right\}, \left\{1.88496, \frac{4305}{8192}\right\}, \left\{2.51327, \frac{2825}{4096}\right\}, \left\{3.14159, \frac{813}{1024}\right\}\right\}$

Out[●]=

Out[●]=

Out[●]=

Out[•]=
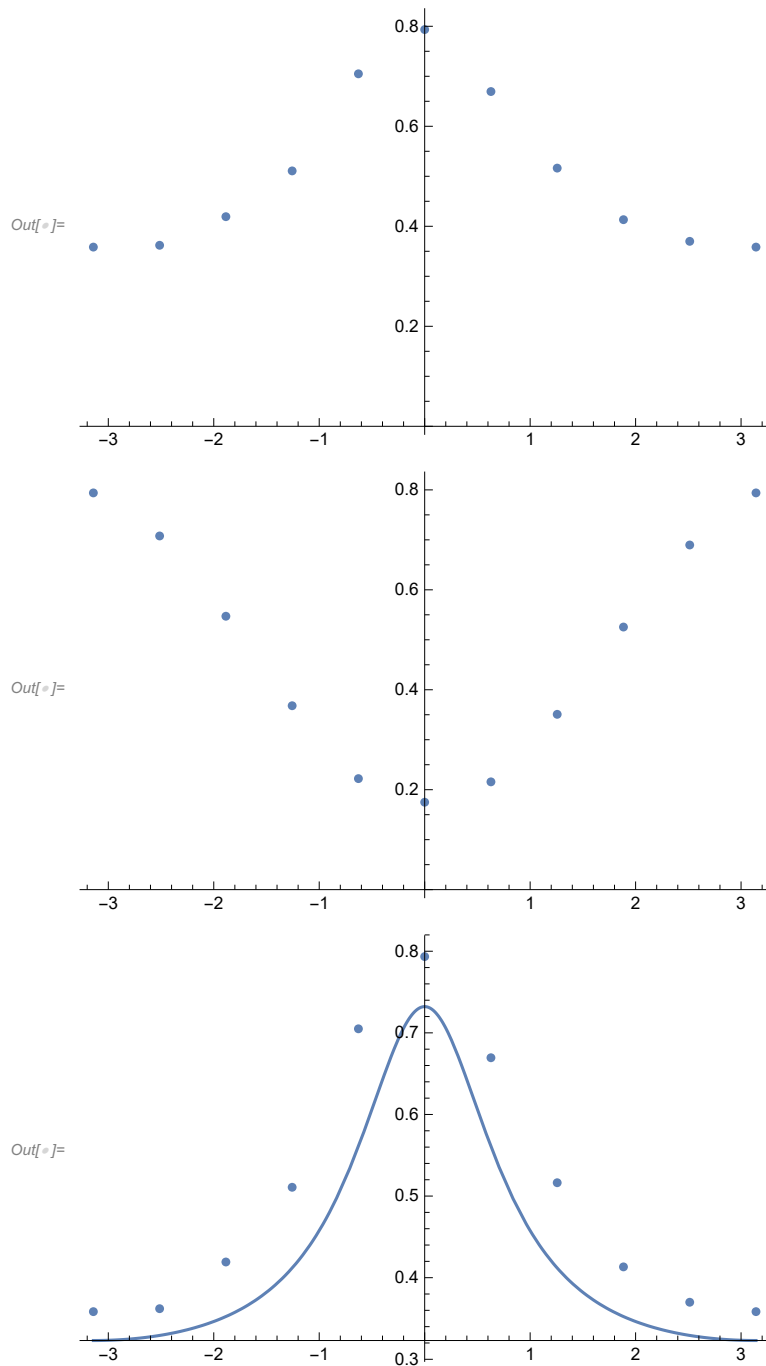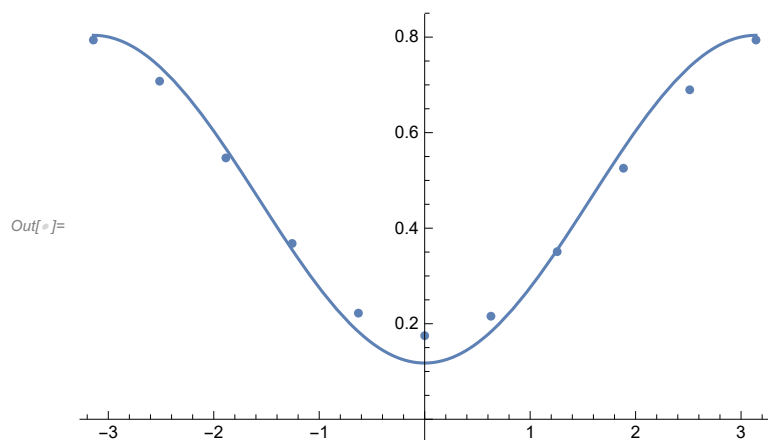
Out[•]= 2091

Out[•]= 1671

Out[•]= 4290

Out[•]= 140

Out[•]= 1947

Out[•]= 2132

Out[•]= 3859

Out[•]= 254

Out[•]= 1644

Out[•]= 3159

Out[•]= 2818

Out[•]= 571

Out[•]= 1273

Out[•]= 4335

Out[•]= 1670

Out[•]= 914

Out[•]= 949

Out[•]= 5161

Out[•]= 794

Out[•]= 1288

Out[•]= 800

Out[•]= 5517

Out[•]= 480

Out[ ]= 1395

Out[ ]= 818

Out[ ]= 5261

Out[ ]= 788

Out[ ]= 1325

Out[ ]= 1226

Out[ ]= 4140

Out[ ]= 1870

Out[ ]= 956

Out[ ]= 1622

Out[ ]= 2896

Out[ ]= 3052

Out[ ]= 622

Out[ ]= 1961

Out[ ]= 2009

Out[ ]= 3950

Out[ ]= 272

Out[ ]= 2091

Out[ ]= 1671

Out[ ]= 4290

Out[ ]= 140

Out[ ]= $\left\{\left\{-\pi, \frac{697}{2127}\right\}, \left\{-2.51327, \frac{1961}{5911}\right\}, \left\{-1.88496, \frac{811}{2337}\right\}, \left\{-1.25664, \frac{613}{1548}\right\}, \left\{-0.628319, \frac{409}{803}\right\}, \right.$
$\left. \left\{0., \frac{5}{8}\right\}, \left\{0.628319, \frac{949}{1743}\right\}, \left\{1.25664, \frac{1273}{2943}\right\}, \left\{1.88496, \frac{822}{2231}\right\}, \left\{2.51327, \frac{1947}{5806}\right\}, \left\{\pi, \frac{697}{2127}\right\}\right\}$

Out[ ]= $\left\{\left\{-\pi, \frac{6381}{8192}\right\}, \left\{-2.51327, \frac{5911}{8192}\right\}, \left\{-1.88496, \frac{2337}{4096}\right\}, \right.$
$\left\{-1.25664, \frac{387}{1024}\right\}, \left\{-0.628319, \frac{803}{4096}\right\}, \left\{0., \frac{5}{32}\right\}, \left\{0.628319, \frac{1743}{8192}\right\}, $
$\left. \left\{1.25664, \frac{2943}{8192}\right\}, \left\{1.88496, \frac{2231}{4096}\right\}, \left\{2.51327, \frac{2903}{4096}\right\}, \left\{3.14159, \frac{6381}{8192}\right\}\right\}$

Out[ ]=

Out[ ]=

Out[ ]=

Out[•]=