

$\ln[\sigma] := \sigma = 6 / 5$

```
(*simulator_extended_stabilizer*)
ZeroZeroFirst10simulatorextendedstabilizer = 2286
ZeroOneFirst10simulatorextendedstabilizer = 2861
OneZeroFirst10simulatorextendedstabilizer = 2963
OneOneFirst10simulatorextendedstabilizer = 82

ZeroZeroFirst08simulatorextendedstabilizer = 2217
ZeroOneFirst08simulatorextendedstabilizer = 3163
OneZeroFirst08simulatorextendedstabilizer = 2690
OneOneFirst08simulatorextendedstabilizer = 122

ZeroZeroFirst06simulatorextendedstabilizer = 1957
ZeroOneFirst06simulatorextendedstabilizer = 3790
OneZeroFirst06simulatorextendedstabilizer = 2195
OneOneFirst06simulatorextendedstabilizer = 250

ZeroZeroFirst04simulatorextendedstabilizer = 1819
ZeroOneFirst04simulatorextendedstabilizer = 4533
OneZeroFirst04simulatorextendedstabilizer = 1478
OneOneFirst04simulatorextendedstabilizer = 362

ZeroZeroFirst02simulatorextendedstabilizer = 1556
ZeroOneFirst02simulatorextendedstabilizer = 5299
OneZeroFirst02simulatorextendedstabilizer = 873
OneOneFirst02simulatorextendedstabilizer = 464

ZeroZeroFirst00simulatorextendedstabilizer = 1553
ZeroOneFirst00simulatorextendedstabilizer = 5491
OneZeroFirst00simulatorextendedstabilizer = 672
OneOneFirst00simulatorextendedstabilizer = 476

ZeroZeroSecond02simulatorextendedstabilizer = 1574
ZeroOneSecond02simulatorextendedstabilizer = 5212
OneZeroSecond02simulatorextendedstabilizer = 941
OneOneSecond02simulatorextendedstabilizer = 465

ZeroZeroSecond04simulatorextendedstabilizer = 1787
ZeroOneSecond04simulatorextendedstabilizer = 4527
OneZeroSecond04simulatorextendedstabilizer = 1491
OneOneSecond04simulatorextendedstabilizer = 387

ZeroZeroSecond06simulatorextendedstabilizer = 2018
ZeroOneSecond06simulatorextendedstabilizer = 3784
OneZeroSecond06simulatorextendedstabilizer = 2162
OneOneSecond06simulatorextendedstabilizer = 228

ZeroZeroSecond08simulatorextendedstabilizer = 2239
ZeroOneSecond08simulatorextendedstabilizer = 3103
OneZeroSecond08simulatorextendedstabilizer = 2748
```

OneOneSecond08simulatorextendedstabilizer = 102

ZeroZeroSecond10simulatorextendedstabilizer = 2286

ZeroOneSecond10simulatorextendedstabilizer = 2861

OneZeroSecond10simulatorextendedstabilizer = 2963

OneOneSecond10simulatorextendedstabilizer = 82

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

Decisivenesssimulatorextendedstabilizer =

$\{ \{-1 * \pi, (\text{OneZeroSecond10simulatorextendedstabilizer} + \text{ZeroZeroSecond10simulatorextendedstabilizer}) / 8192\},$   
 $\{-0.8 * \pi, (\text{OneZeroSecond08simulatorextendedstabilizer} + \text{ZeroZeroSecond08simulatorextendedstabilizer}) / 8192\},$   
 $\{-0.6 * \pi, (\text{OneZeroSecond06simulatorextendedstabilizer} + \text{ZeroZeroSecond06simulatorextendedstabilizer}) / 8192\},$

```

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

```

```

Out[ ] =  $\frac{6}{5}$ 
Out[ ] = 2286
Out[ ] = 2861
Out[ ] = 2963
Out[ ] = 82
Out[ ] = 2217
Out[ ] = 3163
Out[ ] = 2690
Out[ ] = 122
Out[ ] = 1957
Out[ ] = 3790
Out[ ] = 2195
Out[ ] = 250
Out[ ] = 1819
Out[ ] = 4533
Out[ ] = 1478
Out[ ] = 362
Out[ ] = 1556

```

Out[ ]= 5299

Out[ ]= 873

Out[ ]= 464

Out[ ]= 1553

Out[ ]= 5491

Out[ ]= 672

Out[ ]= 476

Out[ ]= 1574

Out[ ]= 5212

Out[ ]= 941

Out[ ]= 465

Out[ ]= 1787

Out[ ]= 4527

Out[ ]= 1491

Out[ ]= 387

Out[ ]= 2018

Out[ ]= 3784

Out[ ]= 2162

Out[ ]= 228

Out[ ]= 2239

Out[ ]= 3103

Out[ ]= 2748

Out[ ]= 102

Out[ ]= 2286

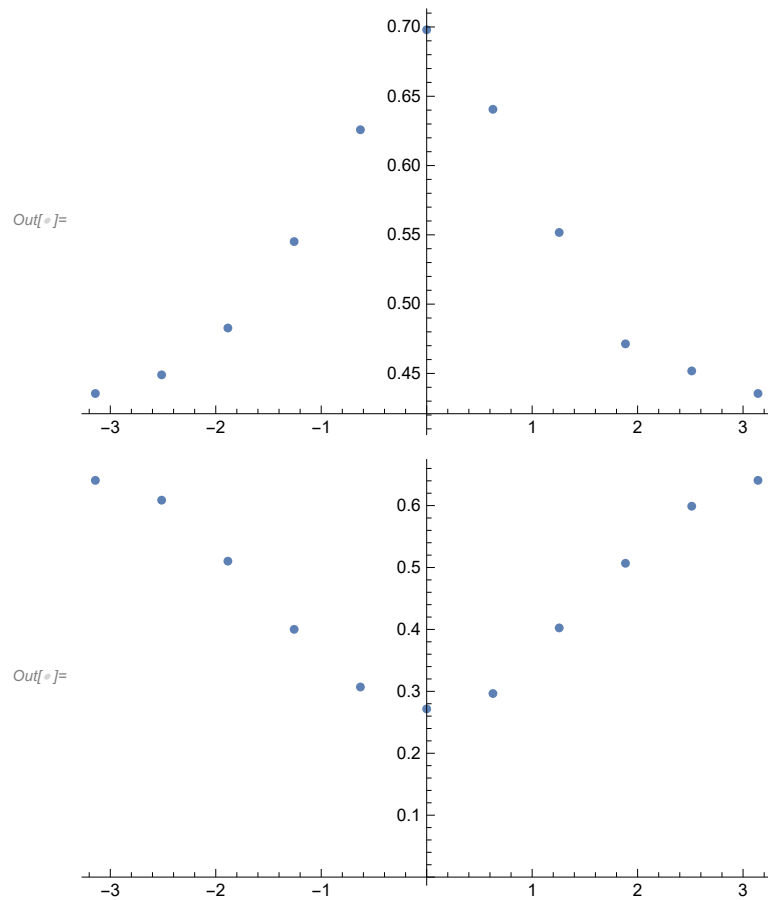
Out[ ]= 2861

Out[ ]= 2963

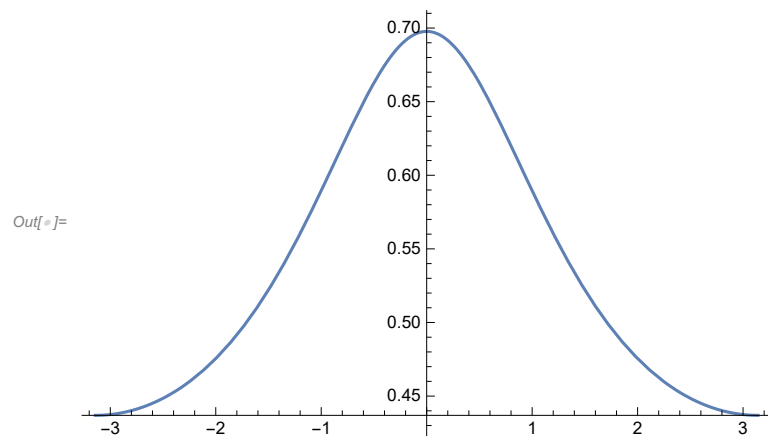
Out[ ]= 82

Out[ ]=  $\left\{ \left\{ -\pi, \frac{2286}{5249} \right\}, \left\{ -2.51327, \frac{2239}{4987} \right\}, \left\{ -1.88496, \frac{1009}{2090} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1787}{3278} \right\}, \left\{ -0.628319, \frac{1574}{2515} \right\}, \left\{ 0., \frac{1553}{2225} \right\}, \left\{ 0.628319, \frac{1556}{2429} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{1819}{3297} \right\}, \left\{ 1.88496, \frac{1957}{4152} \right\}, \left\{ 2.51327, \frac{2217}{4907} \right\}, \left\{ \pi, \frac{2286}{5249} \right\} \right\}$

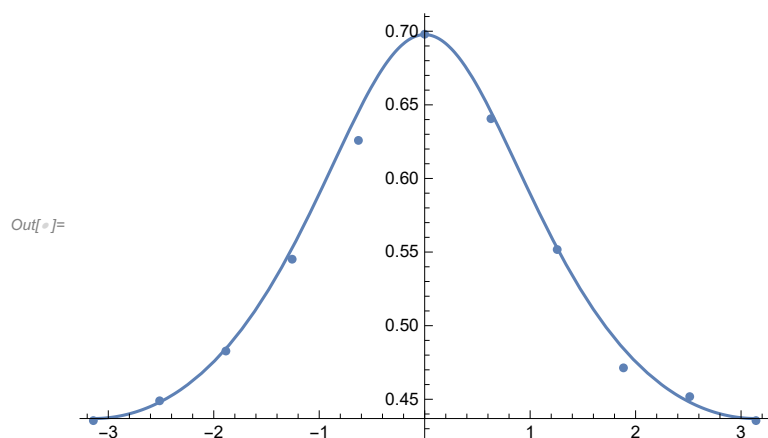
Out[ ]:=  $\left\{ \left\{ -\pi, \frac{5249}{8192} \right\}, \left\{ -2.51327, \frac{4987}{8192} \right\}, \left\{ -1.88496, \frac{1045}{2048} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1639}{4096} \right\}, \left\{ -0.628319, \frac{2515}{8192} \right\}, \left\{ 0., \frac{2225}{8192} \right\}, \left\{ 0.628319, \frac{2429}{8192} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3297}{8192} \right\}, \left\{ 1.88496, \frac{519}{1024} \right\}, \left\{ 2.51327, \frac{4907}{8192} \right\}, \left\{ 3.14159, \frac{5249}{8192} \right\} \right\}$



In[ ]:= **cosTH = Plot**[**1 - N**[**cosSecondFunction**[-x, 6 / 5,  $\pi/2 - 1$ , 1]], {x, - $\pi$ ,  $\pi$ }]

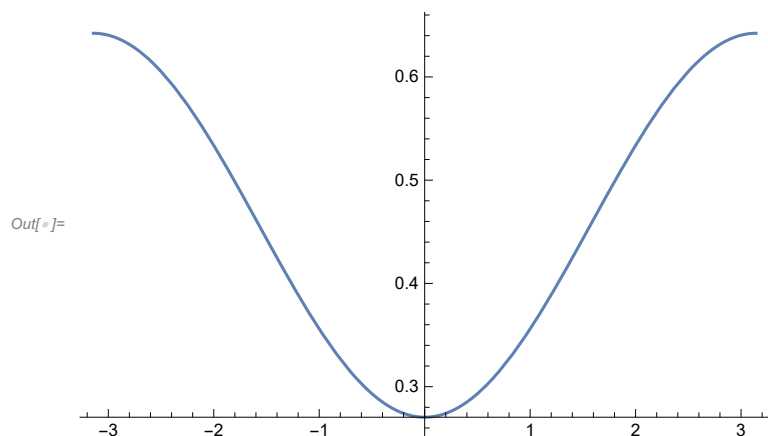


In[ ]:= Show[cosTH, ExpCosSqsimulatorextendedstabilizer]

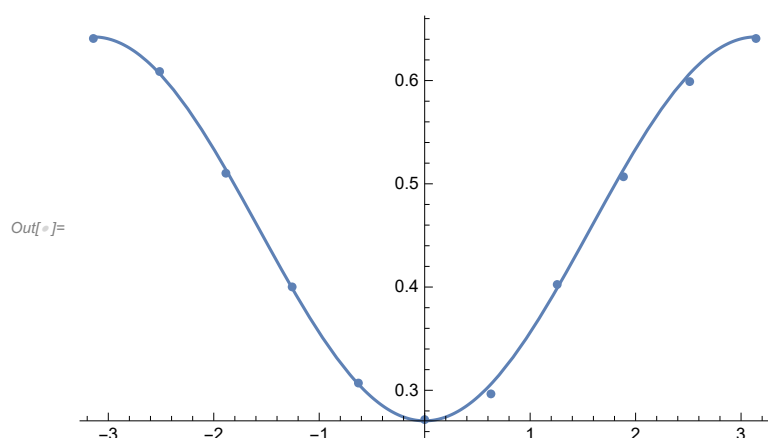


In[ ]:=

In[ ]:= decTH = Plot[DecisivenessSecondFunction[-x, 6/5,  $\pi/2 - 1$ , 2], {x, - $\pi$ ,  $\pi$ }]



In[ ]:= Show[decTH, ExpDecisivenesssimulatorextendedstabilizer]



In[ ]:= (\*simulator\_mps\*)

ZeroZeroFirst10simulatormps = 2321

ZeroOneFirst10simulatormps = 2837

OneZeroFirst10simulatormps = 2962

```

OneOneFirst10simulatormps = 72

ZeroZeroFirst08simulatormps = 2186
ZeroOneFirst08simulatormps = 3122
OneZeroFirst08simulatormps = 2756
OneOneFirst08simulatormps = 128

ZeroZeroFirst06simulatormps = 2072
ZeroOneFirst06simulatormps = 3739
OneZeroFirst06simulatormps = 2147
OneOneFirst06simulatormps = 234

ZeroZeroFirst04simulatormps = 1800
ZeroOneFirst04simulatormps = 4585
OneZeroFirst04simulatormps = 1443
OneOneFirst04simulatormps = 364

ZeroZeroFirst02simulatormps = 1565
ZeroOneFirst02simulatormps = 5273
OneZeroFirst02simulatormps = 868
OneOneFirst02simulatormps = 486

ZeroZeroFirst00simulatormps = 1532
ZeroOneFirst00simulatormps = 5531
OneZeroFirst00simulatormps = 637
OneOneFirst00simulatormps = 492

ZeroZeroSecond02simulatormps = 1634
ZeroOneSecond02simulatormps = 5165
OneZeroSecond02simulatormps = 921
OneOneSecond02simulatormps = 472

ZeroZeroSecond04simulatormps = 1839
ZeroOneSecond04simulatormps = 4472
OneZeroSecond04simulatormps = 1506
OneOneSecond04simulatormps = 375

ZeroZeroSecond06simulatormps = 2004
ZeroOneSecond06simulatormps = 3724
OneZeroSecond06simulatormps = 2242
OneOneSecond06simulatormps = 222

ZeroZeroSecond08simulatormps = 2239
ZeroOneSecond08simulatormps = 3080
OneZeroSecond08simulatormps = 2752
OneOneSecond08simulatormps = 121

ZeroZeroSecond10simulatormps = 2321
ZeroOneSecond10simulatormps = 2837
OneZeroSecond10simulatormps = 2962
OneOneSecond10simulatormps = 72

```

```

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

```

Out[ ]= 2321

Out[ ]= 2837

Out[ ]= 2962

Out[ ]= 72

Out[ ]= 2186

Out[ ]= 3122

Out[ ]= 2756

Out[ ]= 128



Out[ ]= 2072

Out[ ]= 3739

Out[ ]= 2147

Out[ ]= 234

Out[ ]= 1800

Out[ ]= 4585

Out[ ]= 1443

Out[ ]= 364

Out[ ]= 1565

Out[ ]= 5273

Out[ ]= 868

Out[ ]= 486

Out[ ]= 1532

Out[ ]= 5531

Out[ ]= 637

Out[ ]= 492

Out[ ]= 1634

Out[ ]= 5165

Out[ ]= 921

Out[ ]= 472

Out[ ]= 1839

Out[ ]= 4472

Out[ ]= 1506

Out[ ]= 375

Out[ ]= 2004

Out[ ]= 3724

Out[ ]= 2242

Out[ ]= 222

Out[ ]= 2239

Out[ ]= 3080

Out[ ]= 2752

Out[ ]= 121

Out[ ]= 2321

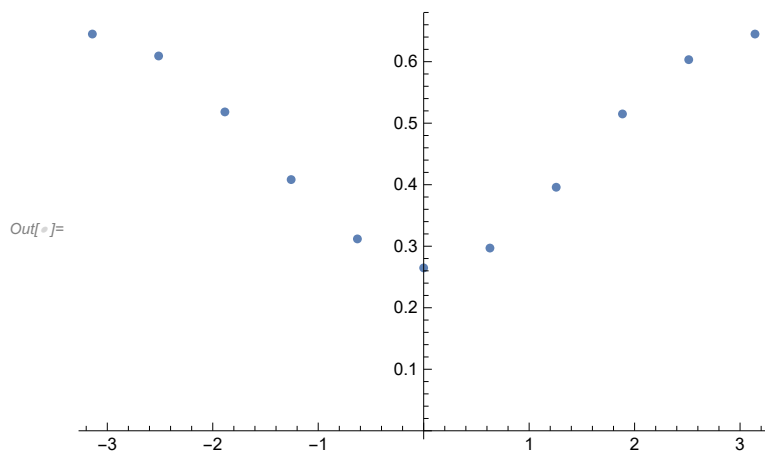
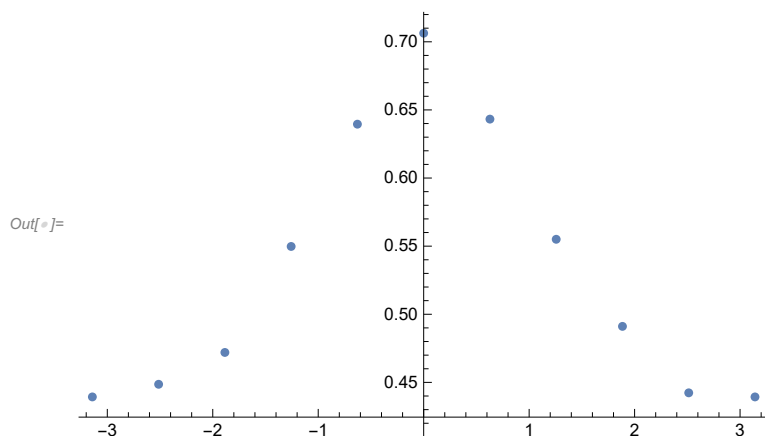
Out[ ]= 2837

Out[ ]= 2962

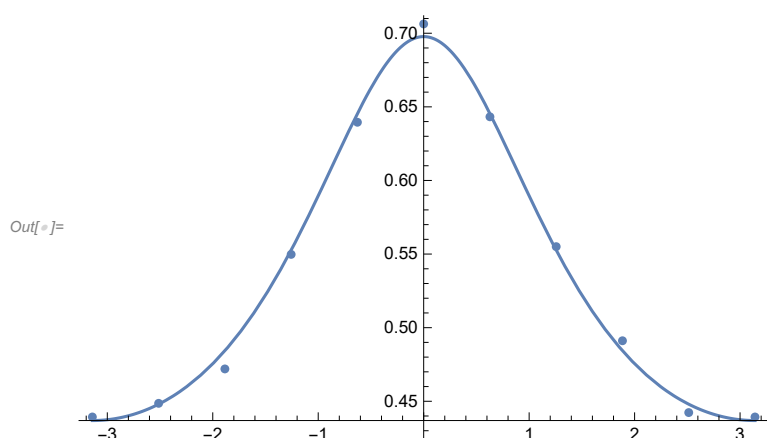
Out[ ]= 72

Out[ ]=  $\left\{ \left\{ -\pi, \frac{2321}{5283} \right\}, \left\{ -2.51327, \frac{2239}{4991} \right\}, \left\{ -1.88496, \frac{1002}{2123} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{613}{1115} \right\}, \left\{ -0.628319, \frac{1634}{2555} \right\}, \left\{ 0., \frac{1532}{2169} \right\}, \left\{ 0.628319, \frac{1565}{2433} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{600}{1081} \right\}, \left\{ 1.88496, \frac{2072}{4219} \right\}, \left\{ 2.51327, \frac{1093}{2471} \right\}, \left\{ \pi, \frac{2321}{5283} \right\} \right\}$

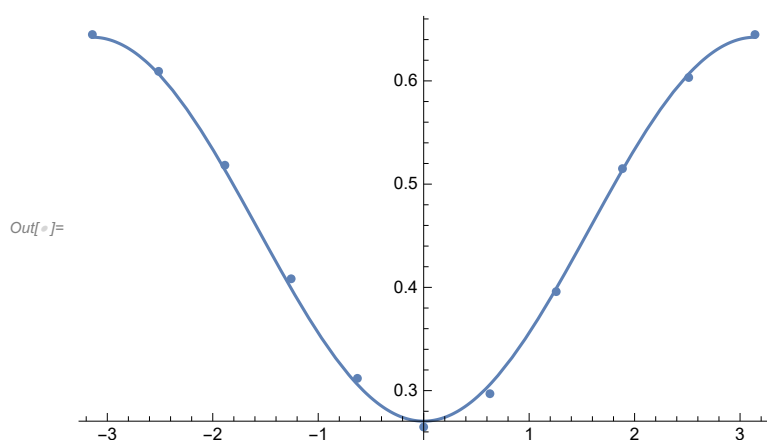
Out[ ]=  $\left\{ \left\{ -\pi, \frac{5283}{8192} \right\}, \left\{ -2.51327, \frac{4991}{8192} \right\}, \left\{ -1.88496, \frac{2123}{4096} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3345}{8192} \right\}, \left\{ -0.628319, \frac{2555}{8192} \right\}, \left\{ 0., \frac{2169}{8192} \right\}, \left\{ 0.628319, \frac{2433}{8192} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3243}{8192} \right\}, \left\{ 1.88496, \frac{4219}{8192} \right\}, \left\{ 2.51327, \frac{2471}{4096} \right\}, \left\{ 3.14159, \frac{5283}{8192} \right\} \right\}$



In[ ]:= Show[cosTH, ExpCosSqsimulatormps]



In[ ]:= Show[decTH, ExpDecisivenesssimulatormps]



In[ ]:= (\*simulator\_statevector\*)

ZeroZeroFirst10simulatorstatevector = 2304

ZeroOneFirst10simulatorstatevector = 2890

OneZeroFirst10simulatorstatevector = 2911

OneOneFirst10simulatorstatevector = 87

ZeroZeroFirst08simulatorstatevector = 2210

ZeroOneFirst08simulatorstatevector = 3115

OneZeroFirst08simulatorstatevector = 2756

OneOneFirst08simulatorstatevector = 111

ZeroZeroFirst06simulatorstatevector = 2025

ZeroOneFirst06simulatorstatevector = 3843

OneZeroFirst06simulatorstatevector = 2106

OneOneFirst06simulatorstatevector = 218

ZeroZeroFirst04simulatorstatevector = 1774

ZeroOneFirst04simulatorstatevector = 4552

OneZeroFirst04simulatorstatevector = 1488

OneOneFirst04simulatorstatevector = 378

```

ZeroZeroFirst02simulatorstatevector = 1599
ZeroOneFirst02simulatorstatevector = 5246
OneZeroFirst02simulatorstatevector = 893
OneOneFirst02simulatorstatevector = 454

```

```

ZeroZeroFirst00simulatorstatevector = 1562
ZeroOneFirst00simulatorstatevector = 5430
OneZeroFirst00simulatorstatevector = 681
OneOneFirst00simulatorstatevector = 519

```

```

ZeroZeroSecond02simulatorstatevector = 1546
ZeroOneSecond02simulatorstatevector = 5258
OneZeroSecond02simulatorstatevector = 933
OneOneSecond02simulatorstatevector = 455

```

```

ZeroZeroSecond04simulatorstatevector = 1779
ZeroOneSecond04simulatorstatevector = 4566
OneZeroSecond04simulatorstatevector = 1498
OneOneSecond04simulatorstatevector = 349

```

```

ZeroZeroSecond06simulatorstatevector = 2100
ZeroOneSecond06simulatorstatevector = 3740
OneZeroSecond06simulatorstatevector = 2138
OneOneSecond06simulatorstatevector = 214

```

```

ZeroZeroSecond08simulatorstatevector = 2248
ZeroOneSecond08simulatorstatevector = 3146
OneZeroSecond08simulatorstatevector = 2696
OneOneSecond08simulatorstatevector = 102

```

```

ZeroZeroSecond10simulatorstatevector = 2304
ZeroOneSecond10simulatorstatevector = 2890
OneZeroSecond10simulatorstatevector = 2911
OneOneSecond10simulatorstatevector = 87

```

```

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

```

```

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

```

Out[ ]= 2304

Out[ ]= 2890

Out[ ]= 2911

Out[ ]= 87

Out[ ]= 2210

Out[ ]= 3115

Out[ ]= 2756

Out[ ]= 111

Out[ ]= 2025

Out[ ]= 3843

Out[ ]= 2106

Out[ ]= 218

Out[ ]= 1774

Out[ ]= 4552

Out[ ]= 1488

Out[ ]= 378

Out[ ]= 1599

Out[ ]= 5246

Out[ ]= 893

Out[ ]= 454

Out[ ]= 1562

Out[ ]= 5430

Out[ ]= 681

Out[ ]= 519

Out[ ]= 1546

Out[ ]= 5258

Out[ ]= 933

Out[ ]= 455

Out[ ]= 1779

Out[ ]= 4566

Out[ ]= 1498

Out[ ]= 349

Out[ ]= 2100

Out[ ]= 3740

Out[ ]= 2138

Out[ ]= 214

Out[ ]= 2248

Out[ ]= 3146

Out[ ]= 2696

Out[ ]= 102

Out[ ]= 2304

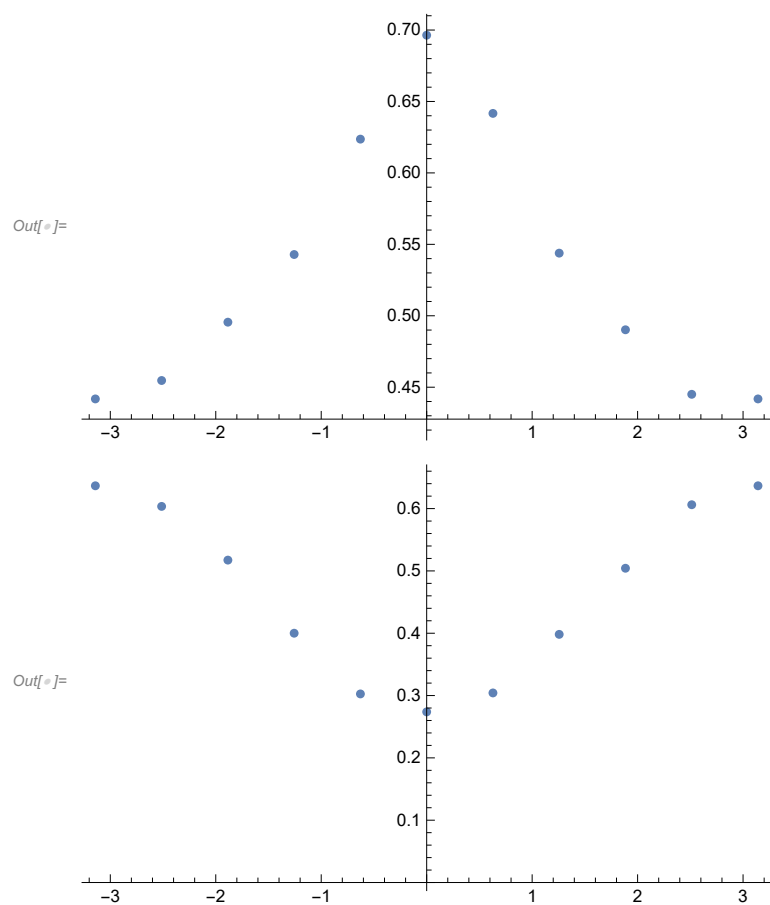
Out[ ]= 2890

Out[ ]= 2911

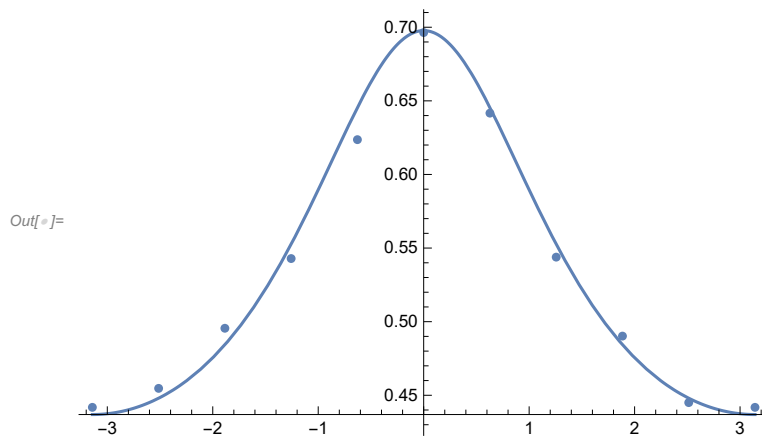
Out[ ]= 87

$$\text{Out}[*]= \left\{ \left\{ -\pi, \frac{2304}{5215} \right\}, \left\{ -2.51327, \frac{281}{618} \right\}, \left\{ -1.88496, \frac{1050}{2119} \right\}, \left\{ -1.25664, \frac{1779}{3277} \right\}, \left\{ -0.628319, \frac{1546}{2479} \right\}, \right. \\ \left. \left\{ 0., \frac{1562}{2243} \right\}, \left\{ 0.628319, \frac{1599}{2492} \right\}, \left\{ 1.25664, \frac{887}{1631} \right\}, \left\{ 1.88496, \frac{25}{51} \right\}, \left\{ 2.51327, \frac{85}{191} \right\}, \left\{ \pi, \frac{2304}{5215} \right\} \right\}$$

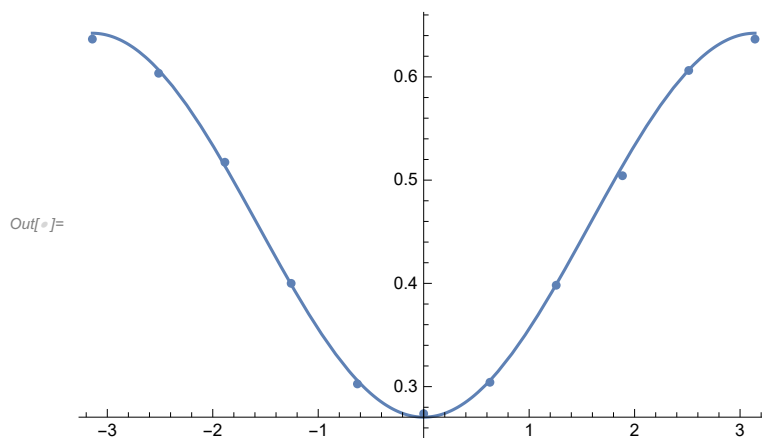
$$\text{Out}[*]= \left\{ \left\{ -\pi, \frac{5215}{8192} \right\}, \left\{ -2.51327, \frac{309}{512} \right\}, \left\{ -1.88496, \frac{2119}{4096} \right\}, \right. \\ \left. \left\{ -1.25664, \frac{3277}{8192} \right\}, \left\{ -0.628319, \frac{2479}{8192} \right\}, \left\{ 0., \frac{2243}{8192} \right\}, \left\{ 0.628319, \frac{623}{2048} \right\}, \right. \\ \left. \left\{ 1.25664, \frac{1631}{4096} \right\}, \left\{ 1.88496, \frac{4131}{8192} \right\}, \left\{ 2.51327, \frac{2483}{4096} \right\}, \left\{ 3.14159, \frac{5215}{8192} \right\} \right\}$$



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



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



```
In[ ]:= (*ibm_nairobi*)
```

```
ZeroZeroFirst10ibmnairobi = 2567
ZeroOneFirst10ibmnairobi = 2710
OneZeroFirst10ibmnairobi = 2808
OneOneFirst10ibmnairobi = 107
```

```
ZeroZeroFirst08ibmnairobi = 2557
ZeroOneFirst08ibmnairobi = 2750
OneZeroFirst08ibmnairobi = 2741
OneOneFirst08ibmnairobi = 144
```

```
ZeroZeroFirst06ibmnairobi = 2554
ZeroOneFirst06ibmnairobi = 3125
OneZeroFirst06ibmnairobi = 2200
OneOneFirst06ibmnairobi = 313
```

```
ZeroZeroFirst04ibmnairobi = 2608
ZeroOneFirst04ibmnairobi = 3730
OneZeroFirst04ibmnairobi = 1411
OneOneFirst04ibmnairobi = 443
```



ZeroZeroFirst02ibmnairobi = 2604  
 ZeroOneFirst02ibmnairobi = 4237  
 OneZeroFirst02ibmnairobi = 769  
 OneOneFirst02ibmnairobi = 582

ZeroZeroFirst00ibmnairobi = 2342  
 ZeroOneFirst00ibmnairobi = 4503  
 OneZeroFirst00ibmnairobi = 686  
 OneOneFirst00ibmnairobi = 661

ZeroZeroSecond02ibmnairobi = 2169  
 ZeroOneSecond02ibmnairobi = 4562  
 OneZeroSecond02ibmnairobi = 971  
 OneOneSecond02ibmnairobi = 490

ZeroZeroSecond04ibmnairobi = 2478  
 ZeroOneSecond04ibmnairobi = 3897  
 OneZeroSecond04ibmnairobi = 1475  
 OneOneSecond04ibmnairobi = 342

ZeroZeroSecond06ibmnairobi = 2606  
 ZeroOneSecond06ibmnairobi = 3032  
 OneZeroSecond06ibmnairobi = 2337  
 OneOneSecond06ibmnairobi = 217

ZeroZeroSecond08ibmnairobi = 2486  
 ZeroOneSecond08ibmnairobi = 2665  
 OneZeroSecond08ibmnairobi = 2889  
 OneOneSecond08ibmnairobi = 152

ZeroZeroSecond10ibmnairobi = 2567  
 ZeroOneSecond10ibmnairobi = 2710  
 OneZeroSecond10ibmnairobi = 2808  
 OneOneSecond10ibmnairobi = 107

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

```

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

```

Out[ ]= 2567

Out[ ]= 2710

Out[ ]= 2808

Out[ ]= 107

Out[ ]= 2557

Out[ ]= 2750

Out[ ]= 2741

Out[ ]= 144

Out[ ]= 2554

Out[ ]= 3125

Out[ ]= 2200

Out[ ]= 313

Out[ ]= 2608

Out[ ]= 3730

Out[ ]= 1411

Out[ ]= 443

Out[ ]= 2604

Out[ ]= 4237

Out[ ]= 769

Out[ ]= 582

Out[ ]= 2342

$\text{Out}[*]= 4503$

$\text{Out}[*]= 686$

$\text{Out}[*]= 661$

$\text{Out}[*]= 2169$

$\text{Out}[*]= 4562$

$\text{Out}[*]= 971$

$\text{Out}[*]= 490$

$\text{Out}[*]= 2478$

$\text{Out}[*]= 3897$

$\text{Out}[*]= 1475$

$\text{Out}[*]= 342$

$\text{Out}[*]= 2606$

$\text{Out}[*]= 3032$

$\text{Out}[*]= 2337$

$\text{Out}[*]= 217$

$\text{Out}[*]= 2486$

$\text{Out}[*]= 2665$

$\text{Out}[*]= 2889$

$\text{Out}[*]= 152$

$\text{Out}[*]= 2567$

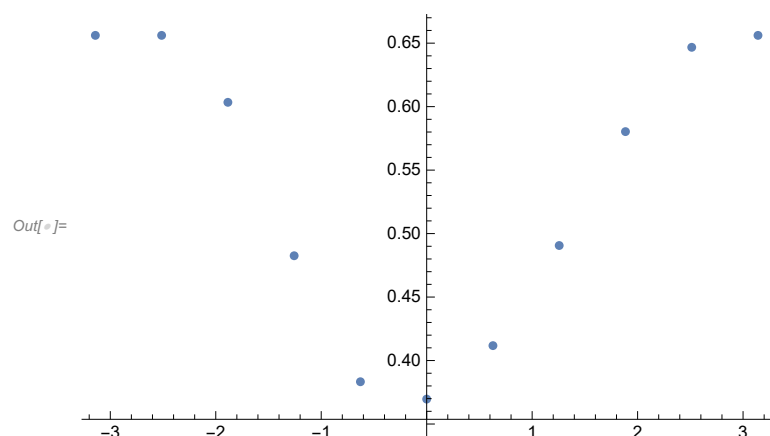
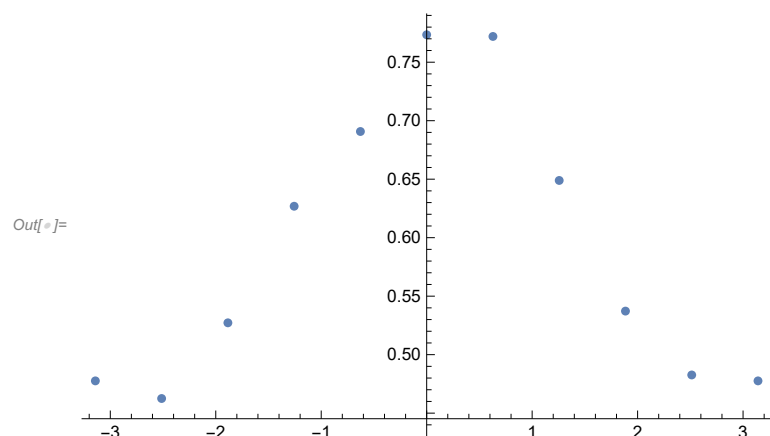
$\text{Out}[*]= 2710$

$\text{Out}[*]= 2808$

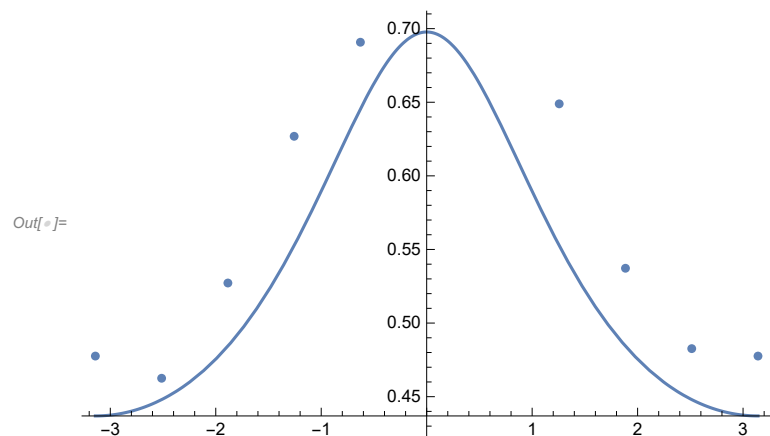
$\text{Out}[*]= 107$

$\text{Out}[*]= \left\{ \left\{ -\pi, \frac{2567}{5375} \right\}, \left\{ -2.51327, \frac{2486}{5375} \right\}, \left\{ -1.88496, \frac{2606}{4943} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{42}{67} \right\}, \left\{ -0.628319, \frac{2169}{3140} \right\}, \left\{ 0., \frac{1171}{1514} \right\}, \left\{ 0.628319, \frac{2604}{3373} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{2608}{4019} \right\}, \left\{ 1.88496, \frac{1277}{2377} \right\}, \left\{ 2.51327, \frac{2557}{5298} \right\}, \left\{ \pi, \frac{2567}{5375} \right\} \right\}$

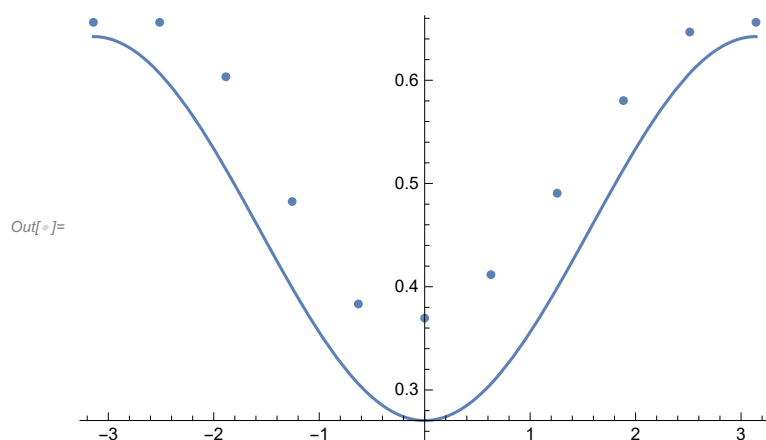
Out[ ]:=  $\left\{ \left\{ -\pi, \frac{5375}{8192} \right\}, \left\{ -2.51327, \frac{5375}{8192} \right\}, \left\{ -1.88496, \frac{4943}{8192} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3953}{8192} \right\}, \left\{ -0.628319, \frac{785}{2048} \right\}, \left\{ 0., \frac{757}{2048} \right\}, \left\{ 0.628319, \frac{3373}{8192} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{4019}{8192} \right\}, \left\{ 1.88496, \frac{2377}{4096} \right\}, \left\{ 2.51327, \frac{2649}{4096} \right\}, \left\{ 3.14159, \frac{5375}{8192} \right\} \right\}$



In[ ]:= Show[cosTH, ExpCosSqibmnairobi]



In[ ]:= Show[decTH, ExpDecisivenessibmnairobi]



In[ ]:= (\*ibm\_oslo\*)

ZeroZeroFirst10ibmoslo = 2463  
 ZeroOneFirst10ibmoslo = 2781  
 OneZeroFirst10ibmoslo = 2711  
 OneOneFirst10ibmoslo = 237

ZeroZeroFirst08ibmoslo = 2495  
 ZeroOneFirst08ibmoslo = 2871  
 OneZeroFirst08ibmoslo = 2482  
 OneOneFirst08ibmoslo = 344

ZeroZeroFirst06ibmoslo = 2214  
 ZeroOneFirst06ibmoslo = 3504  
 OneZeroFirst06ibmoslo = 2011  
 OneOneFirst06ibmoslo = 463

ZeroZeroFirst04ibmoslo = 1876  
 ZeroOneFirst04ibmoslo = 4315  
 OneZeroFirst04ibmoslo = 1383  
 OneOneFirst04ibmoslo = 618

ZeroZeroFirst02ibmoslo = 1603  
 ZeroOneFirst02ibmoslo = 4764  
 OneZeroFirst02ibmoslo = 1055  
 OneOneFirst02ibmoslo = 770

ZeroZeroFirst00ibmoslo = 1409  
 ZeroOneFirst00ibmoslo = 4996  
 OneZeroFirst00ibmoslo = 926  
 OneOneFirst00ibmoslo = 861

ZeroZeroSecond02ibmoslo = 1441  
 ZeroOneSecond02ibmoslo = 4846  
 OneZeroSecond02ibmoslo = 1146  
 OneOneSecond02ibmoslo = 759

```

ZeroZeroSecond04ibmoslo = 1675
ZeroOneSecond04ibmoslo = 4343
OneZeroSecond04ibmoslo = 1580
OneOneSecond04ibmoslo = 594

```

```

ZeroZeroSecond06ibmoslo = 2109
ZeroOneSecond06ibmoslo = 3463
OneZeroSecond06ibmoslo = 2179
OneOneSecond06ibmoslo = 441

```

```

ZeroZeroSecond08ibmoslo = 2243
ZeroOneSecond08ibmoslo = 3152
OneZeroSecond08ibmoslo = 2478
OneOneSecond08ibmoslo = 319

```

```

ZeroZeroSecond10ibmoslo = 2463
ZeroOneSecond10ibmoslo = 2781
OneZeroSecond10ibmoslo = 2711
OneOneSecond10ibmoslo = 237

```

```
CosSqibmoslo =
```

```

{ {-1 *  $\pi$ , ZeroZeroSecond10ibmoslo / (OneZeroSecond10ibmoslo + ZeroZeroSecond10ibmoslo)},
  {-0.8 *  $\pi$ , ZeroZeroSecond08ibmoslo / (OneZeroSecond08ibmoslo + ZeroZeroSecond08ibmoslo)},
  {-0.6 *  $\pi$ , ZeroZeroSecond06ibmoslo / (OneZeroSecond06ibmoslo + ZeroZeroSecond06ibmoslo)},
  {-0.4 *  $\pi$ , ZeroZeroSecond04ibmoslo / (OneZeroSecond04ibmoslo + ZeroZeroSecond04ibmoslo)},
  {-0.2 *  $\pi$ , ZeroZeroSecond02ibmoslo / (OneZeroSecond02ibmoslo + ZeroZeroSecond02ibmoslo)},
  {0.0 *  $\pi$ , ZeroZeroFirst00ibmoslo / (OneZeroFirst00ibmoslo + ZeroZeroFirst00ibmoslo)},
  {0.2 *  $\pi$ , ZeroZeroFirst02ibmoslo / (OneZeroFirst02ibmoslo + ZeroZeroFirst02ibmoslo)},
  {0.4 *  $\pi$ , ZeroZeroFirst04ibmoslo / (OneZeroFirst04ibmoslo + ZeroZeroFirst04ibmoslo)},
  {0.6 *  $\pi$ , ZeroZeroFirst06ibmoslo / (OneZeroFirst06ibmoslo + ZeroZeroFirst06ibmoslo)},
  {0.8 *  $\pi$ , ZeroZeroFirst08ibmoslo / (OneZeroFirst08ibmoslo + ZeroZeroFirst08ibmoslo)},
  {1 *  $\pi$ , ZeroZeroFirst10ibmoslo / (OneZeroFirst10ibmoslo + ZeroZeroFirst10ibmoslo)} }
Decisivenessibmoslo = { {-1 *  $\pi$ , (OneZeroSecond10ibmoslo + ZeroZeroSecond10ibmoslo) / 8192},
  {-0.8 *  $\pi$ , (OneZeroSecond08ibmoslo + ZeroZeroSecond08ibmoslo) / 8192},
  {-0.6 *  $\pi$ , (OneZeroSecond06ibmoslo + ZeroZeroSecond06ibmoslo) / 8192},
  {-0.4 *  $\pi$ , (OneZeroSecond04ibmoslo + ZeroZeroSecond04ibmoslo) / 8192},
  {-0.2 *  $\pi$ , (OneZeroSecond02ibmoslo + ZeroZeroSecond02ibmoslo) / 8192},
  {-0.0 *  $\pi$ , (OneZeroFirst00ibmoslo + ZeroZeroFirst00ibmoslo) / 8192},
  {0.2 *  $\pi$ , (OneZeroFirst02ibmoslo + ZeroZeroFirst02ibmoslo) / 8192},
  {0.4 *  $\pi$ , (OneZeroFirst04ibmoslo + ZeroZeroFirst04ibmoslo) / 8192},
  {0.6 *  $\pi$ , (OneZeroFirst06ibmoslo + ZeroZeroFirst06ibmoslo) / 8192},
  {0.8 *  $\pi$ , (OneZeroFirst08ibmoslo + ZeroZeroFirst08ibmoslo) / 8192},
  {1.0 *  $\pi$ , (OneZeroFirst10ibmoslo + ZeroZeroFirst10ibmoslo) / 8192} }

```

```
ExpCosSqibmoslo = ListPlot[CosSqibmoslo]
```

```
ExpDecisivenessibmoslo = ListPlot[Decisivenessibmoslo]
```

```
Out[ ]= 2463
```

```
Out[ ]= 2781
```

$Out[ \ast ] = 2711$

$Out[ \ast ] = 237$

$Out[ \ast ] = 2495$

$Out[ \ast ] = 2871$

$Out[ \ast ] = 2482$

$Out[ \ast ] = 344$

$Out[ \ast ] = 2214$

$Out[ \ast ] = 3504$

$Out[ \ast ] = 2011$

$Out[ \ast ] = 463$

$Out[ \ast ] = 1876$

$Out[ \ast ] = 4315$

$Out[ \ast ] = 1383$

$Out[ \ast ] = 618$

$Out[ \ast ] = 1603$

$Out[ \ast ] = 4764$

$Out[ \ast ] = 1055$

$Out[ \ast ] = 770$

$Out[ \ast ] = 1409$

$Out[ \ast ] = 4996$

$Out[ \ast ] = 926$

$Out[ \ast ] = 861$

$Out[ \ast ] = 1441$

$Out[ \ast ] = 4846$

$Out[ \ast ] = 1146$

$Out[ \ast ] = 759$

$Out[ \ast ] = 1675$

$Out[ \ast ] = 4343$

$Out[ \ast ] = 1580$

$Out[ \ast ] = 594$

$Out[ \ast ] = 2109$

Out[ ]= 3463

Out[ ]= 2179

Out[ ]= 441

Out[ ]= 2243

Out[ ]= 3152

Out[ ]= 2478

Out[ ]= 319

Out[ ]= 2463

Out[ ]= 2781

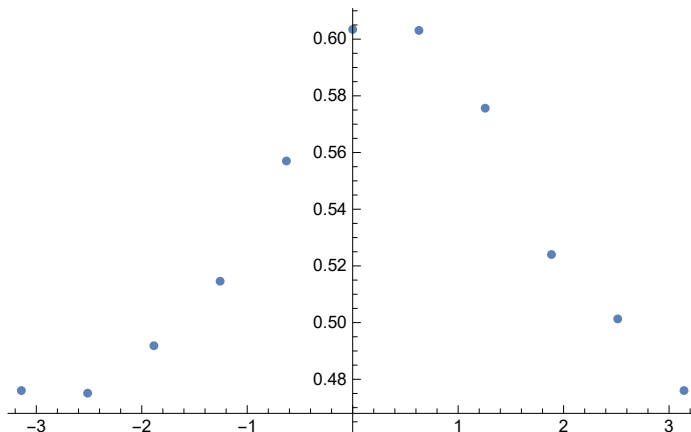
Out[ ]= 2711

Out[ ]= 237

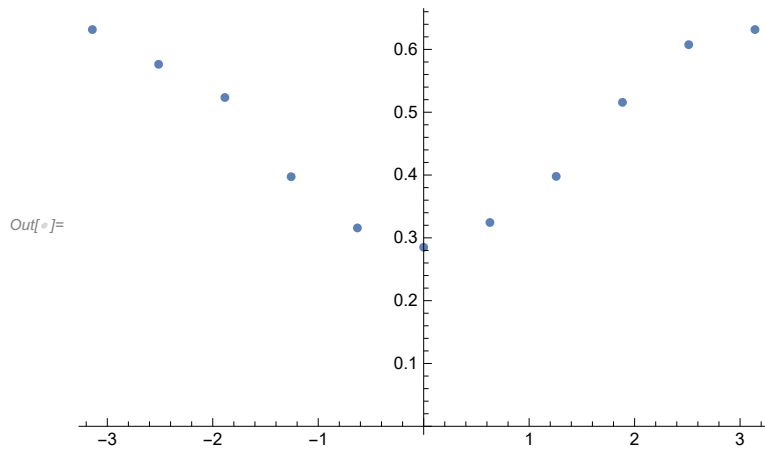
Out[ ]=  $\left\{ \left\{ -\pi, \frac{2463}{5174} \right\}, \left\{ -2.51327, \frac{2243}{4721} \right\}, \left\{ -1.88496, \frac{2109}{4288} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{335}{651} \right\}, \left\{ -0.628319, \frac{1441}{2587} \right\}, \left\{ 0., \frac{1409}{2335} \right\}, \left\{ 0.628319, \frac{1603}{2658} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{1876}{3259} \right\}, \left\{ 1.88496, \frac{2214}{4225} \right\}, \left\{ 2.51327, \frac{2495}{4977} \right\}, \left\{ \pi, \frac{2463}{5174} \right\} \right\}$

Out[ ]=  $\left\{ \left\{ -\pi, \frac{2587}{4096} \right\}, \left\{ -2.51327, \frac{4721}{8192} \right\}, \left\{ -1.88496, \frac{67}{128} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3255}{8192} \right\}, \left\{ -0.628319, \frac{2587}{8192} \right\}, \left\{ 0., \frac{2335}{8192} \right\}, \left\{ 0.628319, \frac{1329}{4096} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3259}{8192} \right\}, \left\{ 1.88496, \frac{4225}{8192} \right\}, \left\{ 2.51327, \frac{4977}{8192} \right\}, \left\{ 3.14159, \frac{2587}{4096} \right\} \right\}$

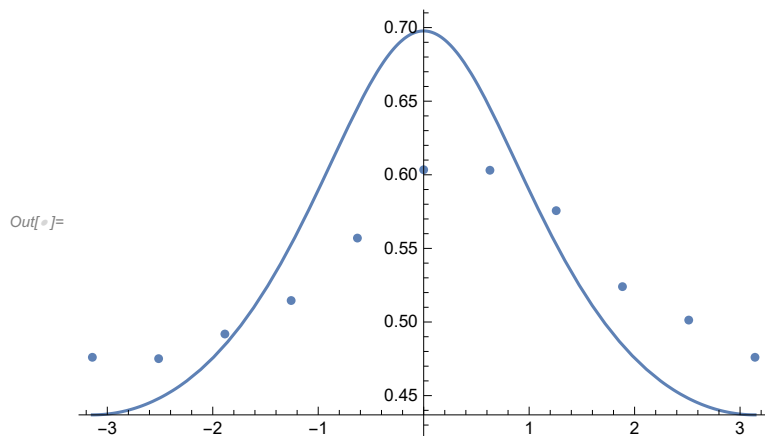
Out[ ]=



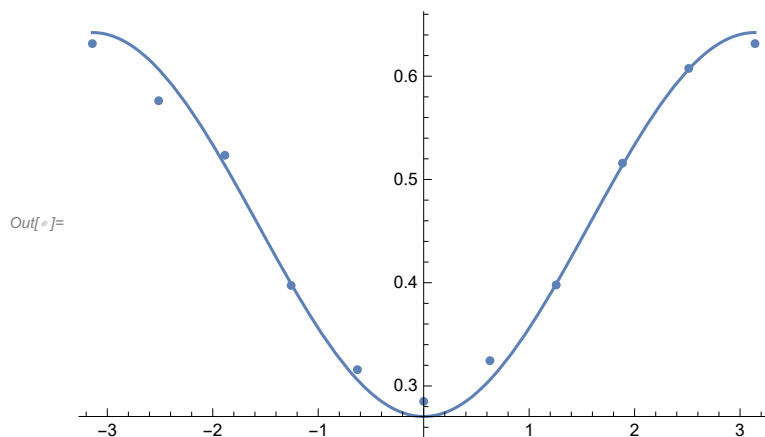




In[ ]:= **Show[cosh, ExpCosSqibmoslo]**



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



In[ ]:= **(\*ibmq\_manila\*)**

**ZeroZeroFirst10ibmqmanila = 2476**

**ZeroOneFirst10ibmqmanila = 2830**

**OneZeroFirst10ibmqmanila = 2692**

**OneOneFirst10ibmqmanila = 194**

**ZeroZeroFirst08ibmqmanila = 2482**

ZeroOneFirst08ibmqmanila = 2949  
 OneZeroFirst08ibmqmanila = 2545  
 OneOneFirst08ibmqmanila = 216

ZeroZeroFirst06ibmqmanila = 2289  
 ZeroOneFirst06ibmqmanila = 3577  
 OneZeroFirst06ibmqmanila = 2039  
 OneOneFirst06ibmqmanila = 287

ZeroZeroFirst04ibmqmanila = 2121  
 ZeroOneFirst04ibmqmanila = 4386  
 OneZeroFirst04ibmqmanila = 1293  
 OneOneFirst04ibmqmanila = 392

ZeroZeroFirst02ibmqmanila = 1918  
 ZeroOneFirst02ibmqmanila = 4869  
 OneZeroFirst02ibmqmanila = 917  
 OneOneFirst02ibmqmanila = 488

ZeroZeroFirst00ibmqmanila = 1962  
 ZeroOneFirst00ibmqmanila = 4948  
 OneZeroFirst00ibmqmanila = 741  
 OneOneFirst00ibmqmanila = 541

ZeroZeroSecond02ibmqmanila = 1830  
 ZeroOneSecond02ibmqmanila = 4832  
 OneZeroSecond02ibmqmanila = 992  
 OneOneSecond02ibmqmanila = 538

ZeroZeroSecond04ibmqmanila = 1921  
 ZeroOneSecond04ibmqmanila = 4341  
 OneZeroSecond04ibmqmanila = 1580  
 OneOneSecond04ibmqmanila = 350

ZeroZeroSecond06ibmqmanila = 2391  
 ZeroOneSecond06ibmqmanila = 3249  
 OneZeroSecond06ibmqmanila = 2212  
 OneOneSecond06ibmqmanila = 340

ZeroZeroSecond08ibmqmanila = 2462  
 ZeroOneSecond08ibmqmanila = 3006  
 OneZeroSecond08ibmqmanila = 2449  
 OneOneSecond08ibmqmanila = 275

ZeroZeroSecond10ibmqmanila = 2476  
 ZeroOneSecond10ibmqmanila = 2830  
 OneZeroSecond10ibmqmanila = 2692  
 OneOneSecond10ibmqmanila = 194

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

```

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

```

Out[ ]= 2476

Out[ ]= 2830

Out[ ]= 2692

Out[ ]= 194

Out[ ]= 2482

Out[ ]= 2949

Out[ ]= 2545

Out[ ]= 216

Out[ ]= 2289

Out[ ]= 3577

Out[ ]= 2039

Out[ ]= 287

Out[ ]= 2121

Out[ ]= 4386

Out[ ]= 1293

Out[ ]= 392

Out[ ]= 1918

Out[ ]= 4869

Out[ ]= 917

Out[ ]= 488

Out[ ]= 1962

Out[ ]= 4948

Out[ ]= 741

Out[ ]= 541

Out[ ]= 1830

Out[ ]= 4832

Out[ ]= 992

Out[ ]= 538

Out[ ]= 1921

Out[ ]= 4341

Out[ ]= 1580

Out[ ]= 350

Out[ ]= 2391

Out[ ]= 3249

Out[ ]= 2212

Out[ ]= 340

Out[ ]= 2462

Out[ ]= 3006

Out[ ]= 2449

Out[ ]= 275

Out[ ]= 2476

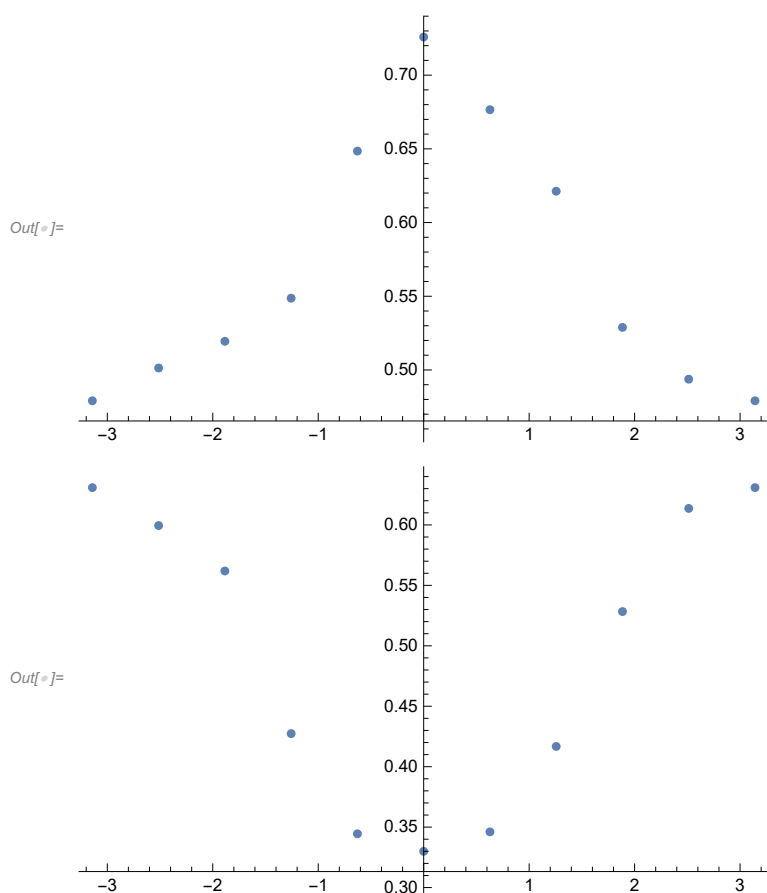
Out[ ]= 2830

Out[ ]= 2692

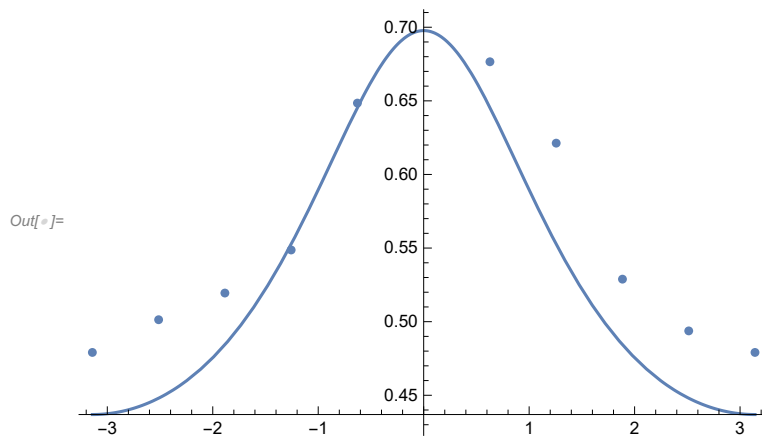
Out[ ]= 194

Out[ ]=  $\left\{ \left\{ -\pi, \frac{619}{1292} \right\}, \left\{ -2.51327, \frac{2462}{4911} \right\}, \left\{ -1.88496, \frac{2391}{4603} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1921}{3501} \right\}, \left\{ -0.628319, \frac{915}{1411} \right\}, \left\{ 0., \frac{654}{901} \right\}, \left\{ 0.628319, \frac{274}{405} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{707}{1138} \right\}, \left\{ 1.88496, \frac{2289}{4328} \right\}, \left\{ 2.51327, \frac{2482}{5027} \right\}, \left\{ \pi, \frac{619}{1292} \right\} \right\}$

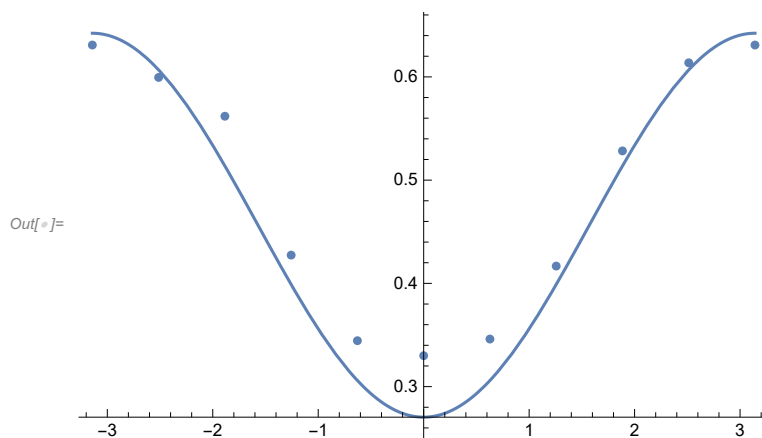
Out[ ]=  $\left\{ \left\{ -\pi, \frac{323}{512} \right\}, \left\{ -2.51327, \frac{4911}{8192} \right\}, \left\{ -1.88496, \frac{4603}{8192} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3501}{8192} \right\}, \left\{ -0.628319, \frac{1411}{4096} \right\}, \left\{ 0., \frac{2703}{8192} \right\}, \left\{ 0.628319, \frac{2835}{8192} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{1707}{4096} \right\}, \left\{ 1.88496, \frac{541}{1024} \right\}, \left\{ 2.51327, \frac{5027}{8192} \right\}, \left\{ 3.14159, \frac{323}{512} \right\} \right\}$



```
In[ ]:= Show[cosTH, ExpCosSqibmqmanila]
```



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



```
In[ ]:= (*ibmq_quito*)
```

```
ZeroZeroFirst10ibmqquito = 2364
```

```
ZeroOneFirst10ibmqquito = 2524
```

```
OneZeroFirst10ibmqquito = 3092
```

```
OneOneFirst10ibmqquito = 212
```

```
ZeroZeroFirst08ibmqquito = 2207
```

```
ZeroOneFirst08ibmqquito = 2975
```

```
OneZeroFirst08ibmqquito = 2746
```

```
OneOneFirst08ibmqquito = 264
```

```
ZeroZeroFirst06ibmqquito = 2221
```

```
ZeroOneFirst06ibmqquito = 3688
```

```
OneZeroFirst06ibmqquito = 1906
```

```
OneOneFirst06ibmqquito = 377
```

```
ZeroZeroFirst04ibmqquito = 2227
```

```
ZeroOneFirst04ibmqquito = 4482
```

```
OneZeroFirst04ibmqquito = 1038
```

```
OneOneFirst04ibmqquito = 445
```

```

ZeroZeroFirst02ibmqquito = 2289
ZeroOneFirst02ibmqquito = 4777
OneZeroFirst02ibmqquito = 637
OneOneFirst02ibmqquito = 489

```

```

ZeroZeroFirst00ibmqquito = 2174
ZeroOneFirst00ibmqquito = 4992
OneZeroFirst00ibmqquito = 503
OneOneFirst00ibmqquito = 523

```

```

ZeroZeroSecond02ibmqquito = 2348
ZeroOneSecond02ibmqquito = 4623
OneZeroSecond02ibmqquito = 728
OneOneSecond02ibmqquito = 493

```

```

ZeroZeroSecond04ibmqquito = 2168
ZeroOneSecond04ibmqquito = 4335
OneZeroSecond04ibmqquito = 1191
OneOneSecond04ibmqquito = 498

```

```

ZeroZeroSecond06ibmqquito = 2150
ZeroOneSecond06ibmqquito = 3513
OneZeroSecond06ibmqquito = 2118
OneOneSecond06ibmqquito = 411

```

```

ZeroZeroSecond08ibmqquito = 2253
ZeroOneSecond08ibmqquito = 2736
OneZeroSecond08ibmqquito = 2883
OneOneSecond08ibmqquito = 320

```

```

ZeroZeroSecond10ibmqquito = 2364
ZeroOneSecond10ibmqquito = 2524
OneZeroSecond10ibmqquito = 3092
OneOneSecond10ibmqquito = 212

```

```

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

```

```
{ {-1 *  $\pi$ , (OneZeroSecond10ibmqquito + ZeroZeroSecond10ibmqquito) / 8192},
  {-0.8 *  $\pi$ , (OneZeroSecond08ibmqquito + ZeroZeroSecond08ibmqquito) / 8192},
  {-0.6 *  $\pi$ , (OneZeroSecond06ibmqquito + ZeroZeroSecond06ibmqquito) / 8192},
  {-0.4 *  $\pi$ , (OneZeroSecond04ibmqquito + ZeroZeroSecond04ibmqquito) / 8192},
  {-0.2 *  $\pi$ , (OneZeroSecond02ibmqquito + ZeroZeroSecond02ibmqquito) / 8192},
  {-0.0 *  $\pi$ , (OneZeroFirst00ibmqquito + ZeroZeroFirst00ibmqquito) / 8192},
  {0.2 *  $\pi$ , (OneZeroFirst02ibmqquito + ZeroZeroFirst02ibmqquito) / 8192},
  {0.4 *  $\pi$ , (OneZeroFirst04ibmqquito + ZeroZeroFirst04ibmqquito) / 8192},
  {0.6 *  $\pi$ , (OneZeroFirst06ibmqquito + ZeroZeroFirst06ibmqquito) / 8192},
  {0.8 *  $\pi$ , (OneZeroFirst08ibmqquito + ZeroZeroFirst08ibmqquito) / 8192},
  {1.0 *  $\pi$ , (OneZeroFirst10ibmqquito + ZeroZeroFirst10ibmqquito) / 8192}}
```

```
ExpCosSqibmqquito = ListPlot[CosSqibmqquito]
```

```
ExpDecisivenessibmqquito = ListPlot[Decisivenessibmqquito]
```

```
Out[ ]= 2364
```

```
Out[ ]= 2524
```

```
Out[ ]= 3092
```

```
Out[ ]= 212
```

```
Out[ ]= 2207
```

```
Out[ ]= 2975
```

```
Out[ ]= 2746
```

```
Out[ ]= 264
```

```
Out[ ]= 2221
```

```
Out[ ]= 3688
```

```
Out[ ]= 1906
```

```
Out[ ]= 377
```

```
Out[ ]= 2227
```

```
Out[ ]= 4482
```

```
Out[ ]= 1038
```

```
Out[ ]= 445
```

```
Out[ ]= 2289
```

```
Out[ ]= 4777
```

```
Out[ ]= 637
```

```
Out[ ]= 489
```

```
Out[ ]= 2174
```

```
Out[ ]= 4992
```



$Out[\#]= 503$

$Out[\#]= 523$

$Out[\#]= 2348$

$Out[\#]= 4623$

$Out[\#]= 728$

$Out[\#]= 493$

$Out[\#]= 2168$

$Out[\#]= 4335$

$Out[\#]= 1191$

$Out[\#]= 498$

$Out[\#]= 2150$

$Out[\#]= 3513$

$Out[\#]= 2118$

$Out[\#]= 411$

$Out[\#]= 2253$

$Out[\#]= 2736$

$Out[\#]= 2883$

$Out[\#]= 320$

$Out[\#]= 2364$

$Out[\#]= 2524$

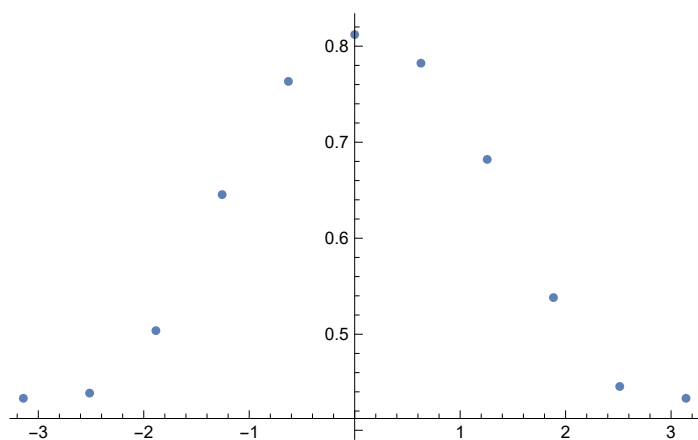
$Out[\#]= 3092$

$Out[\#]= 212$

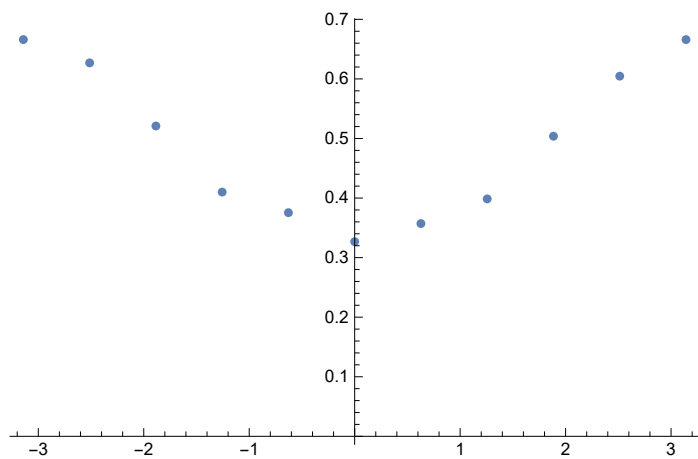
$Out[\#]= \left\{ \left\{ -\pi, \frac{591}{1364} \right\}, \left\{ -2.51327, \frac{751}{1712} \right\}, \left\{ -1.88496, \frac{1075}{2134} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{2168}{3359} \right\}, \left\{ -0.628319, \frac{587}{769} \right\}, \left\{ 0., \frac{2174}{2677} \right\}, \left\{ 0.628319, \frac{327}{418} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{2227}{3265} \right\}, \left\{ 1.88496, \frac{2221}{4127} \right\}, \left\{ 2.51327, \frac{2207}{4953} \right\}, \left\{ \pi, \frac{591}{1364} \right\} \right\}$

$Out[\#]= \left\{ \left\{ -\pi, \frac{341}{512} \right\}, \left\{ -2.51327, \frac{321}{512} \right\}, \left\{ -1.88496, \frac{1067}{2048} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3359}{8192} \right\}, \left\{ -0.628319, \frac{769}{2048} \right\}, \left\{ 0., \frac{2677}{8192} \right\}, \left\{ 0.628319, \frac{1463}{4096} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3265}{8192} \right\}, \left\{ 1.88496, \frac{4127}{8192} \right\}, \left\{ 2.51327, \frac{4953}{8192} \right\}, \left\{ 3.14159, \frac{341}{512} \right\} \right\}$

Out[ ]:=

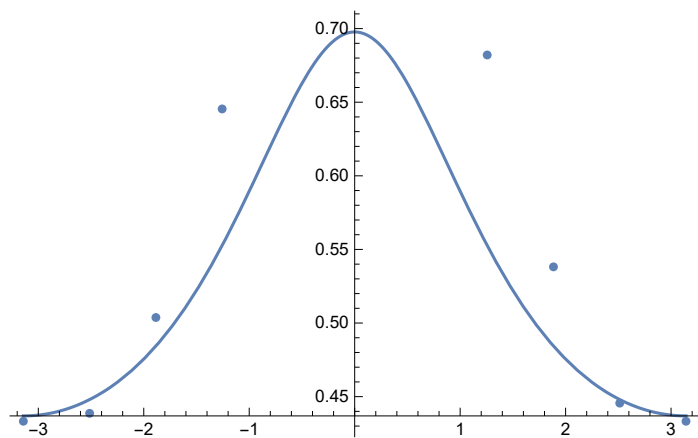


Out[ ]:=

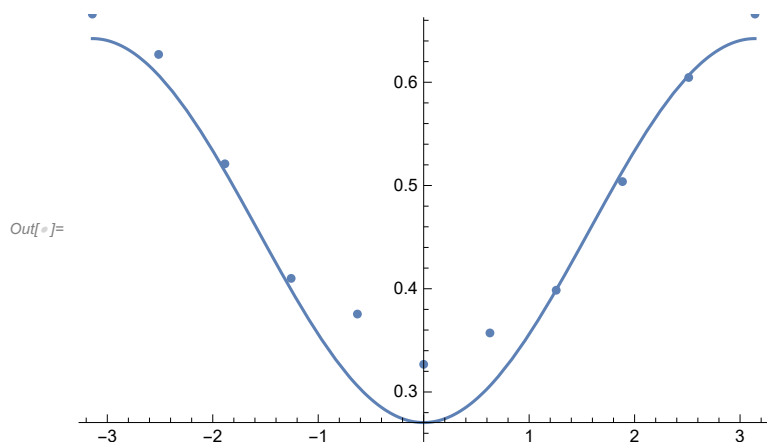


In[ ]:= Show[cosTH, ExpCosSqibmqquito]

Out[ ]:=



In[ ]:= Show[decTH, ExpDecisivenessibmqquito]



In[ ]:= (\*ibmq\_lima\*)

ZeroZeroFirst10ibmq\_1ima = 2532

ZeroOneFirst10ibmq\_1ima = 2653

OneZeroFirst10ibmq\_1ima = 2856

OneOneFirst10ibmq\_1ima = 151

ZeroZeroFirst08ibmq\_1ima = 2532

ZeroOneFirst08ibmq\_1ima = 2837

OneZeroFirst08ibmq\_1ima = 2577

OneOneFirst08ibmq\_1ima = 246

ZeroZeroFirst06ibmq\_1ima = 2269

ZeroOneFirst06ibmq\_1ima = 3515

OneZeroFirst06ibmq\_1ima = 1987

OneOneFirst06ibmq\_1ima = 421

ZeroZeroFirst04ibmq\_1ima = 2059

ZeroOneFirst04ibmq\_1ima = 4200

OneZeroFirst04ibmq\_1ima = 1365

OneOneFirst04ibmq\_1ima = 568

ZeroZeroFirst02ibmq\_1ima = 1949

ZeroOneFirst02ibmq\_1ima = 4668

OneZeroFirst02ibmq\_1ima = 927

OneOneFirst02ibmq\_1ima = 648

ZeroZeroFirst00ibmq\_1ima = 1711

ZeroOneFirst00ibmq\_1ima = 5203

OneZeroFirst00ibmq\_1ima = 722

OneOneFirst00ibmq\_1ima = 556

ZeroZeroSecond02ibmq\_1ima = 1809

ZeroOneSecond02ibmq\_1ima = 4992

OneZeroSecond02ibmq\_1ima = 909

OneOneSecond02ibmq\_1ima = 482

```

ZeroZeroSecond04ibmq1ima = 2162
ZeroOneSecond04ibmq1ima = 4240
OneZeroSecond04ibmq1ima = 1390
OneOneSecond04ibmq1ima = 400

```

```

ZeroZeroSecond06ibmq1ima = 2223
ZeroOneSecond06ibmq1ima = 3612
OneZeroSecond06ibmq1ima = 2093
OneOneSecond06ibmq1ima = 264

```

```

ZeroZeroSecond08ibmq1ima = 2399
ZeroOneSecond08ibmq1ima = 3126
OneZeroSecond08ibmq1ima = 2490
OneOneSecond08ibmq1ima = 177

```

```

ZeroZeroSecond10ibmq1ima = 2532
ZeroOneSecond10ibmq1ima = 2653
OneZeroSecond10ibmq1ima = 2856
OneOneSecond10ibmq1ima = 151

```

```
CosSqibmq1ima =
```

```

{{-1 *  $\pi$ , ZeroZeroSecond10ibmq1ima / (OneZeroSecond10ibmq1ima + ZeroZeroSecond10ibmq1ima)},
{-0.8 *  $\pi$ , ZeroZeroSecond08ibmq1ima /
  (OneZeroSecond08ibmq1ima + ZeroZeroSecond08ibmq1ima)}, {-0.6 *  $\pi$ ,
  ZeroZeroSecond06ibmq1ima / (OneZeroSecond06ibmq1ima + ZeroZeroSecond06ibmq1ima)},
{-0.4 *  $\pi$ , ZeroZeroSecond04ibmq1ima /
  (OneZeroSecond04ibmq1ima + ZeroZeroSecond04ibmq1ima)}, {-0.2 *  $\pi$ ,
  ZeroZeroSecond02ibmq1ima / (OneZeroSecond02ibmq1ima + ZeroZeroSecond02ibmq1ima)},
{0.0 *  $\pi$ , ZeroZeroFirst00ibmq1ima / (OneZeroFirst00ibmq1ima + ZeroZeroFirst00ibmq1ima)},
{0.2 *  $\pi$ , ZeroZeroFirst02ibmq1ima / (OneZeroFirst02ibmq1ima + ZeroZeroFirst02ibmq1ima)},
{0.4 *  $\pi$ , ZeroZeroFirst04ibmq1ima / (OneZeroFirst04ibmq1ima + ZeroZeroFirst04ibmq1ima)},
{0.6 *  $\pi$ , ZeroZeroFirst06ibmq1ima / (OneZeroFirst06ibmq1ima + ZeroZeroFirst06ibmq1ima)},
{0.8 *  $\pi$ , ZeroZeroFirst08ibmq1ima / (OneZeroFirst08ibmq1ima + ZeroZeroFirst08ibmq1ima)},
{1 *  $\pi$ , ZeroZeroFirst10ibmq1ima / (OneZeroFirst10ibmq1ima + ZeroZeroFirst10ibmq1ima)}}

```

```
Decisivenessibmq1ima =
```

```

{{-1 *  $\pi$ , (OneZeroSecond10ibmq1ima + ZeroZeroSecond10ibmq1ima) / 8192},
{-0.8 *  $\pi$ , (OneZeroSecond08ibmq1ima + ZeroZeroSecond08ibmq1ima) / 8192},
{-0.6 *  $\pi$ , (OneZeroSecond06ibmq1ima + ZeroZeroSecond06ibmq1ima) / 8192},
{-0.4 *  $\pi$ , (OneZeroSecond04ibmq1ima + ZeroZeroSecond04ibmq1ima) / 8192},
{-0.2 *  $\pi$ , (OneZeroSecond02ibmq1ima + ZeroZeroSecond02ibmq1ima) / 8192},
{-0.0 *  $\pi$ , (OneZeroFirst00ibmq1ima + ZeroZeroFirst00ibmq1ima) / 8192},
{0.2 *  $\pi$ , (OneZeroFirst02ibmq1ima + ZeroZeroFirst02ibmq1ima) / 8192},
{0.4 *  $\pi$ , (OneZeroFirst04ibmq1ima + ZeroZeroFirst04ibmq1ima) / 8192},
{0.6 *  $\pi$ , (OneZeroFirst06ibmq1ima + ZeroZeroFirst06ibmq1ima) / 8192},
{0.8 *  $\pi$ , (OneZeroFirst08ibmq1ima + ZeroZeroFirst08ibmq1ima) / 8192},
{1.0 *  $\pi$ , (OneZeroFirst10ibmq1ima + ZeroZeroFirst10ibmq1ima) / 8192}}

```

```
ExpCosSqibmq1ima = ListPlot[CosSqibmq1ima]
```

```
ExpDecisivenessibmq1ima = ListPlot[Decisivenessibmq1ima]
```

$Out[ \ast ] = 2532$

$Out[ \ast ] = 2653$

$Out[ \ast ] = 2856$

$Out[ \ast ] = 151$

$Out[ \ast ] = 2532$

$Out[ \ast ] = 2837$

$Out[ \ast ] = 2577$

$Out[ \ast ] = 246$

$Out[ \ast ] = 2269$

$Out[ \ast ] = 3515$

$Out[ \ast ] = 1987$

$Out[ \ast ] = 421$

$Out[ \ast ] = 2059$

$Out[ \ast ] = 4200$

$Out[ \ast ] = 1365$

$Out[ \ast ] = 568$

$Out[ \ast ] = 1949$

$Out[ \ast ] = 4668$

$Out[ \ast ] = 927$

$Out[ \ast ] = 648$

$Out[ \ast ] = 1711$

$Out[ \ast ] = 5203$

$Out[ \ast ] = 722$

$Out[ \ast ] = 556$

$Out[ \ast ] = 1809$

$Out[ \ast ] = 4992$

$Out[ \ast ] = 909$

$Out[ \ast ] = 482$

$Out[ \ast ] = 2162$

$Out[ \ast ] = 4240$

$Out[ \ast ] = 1390$

Out[ ]= 400

Out[ ]= 2223

Out[ ]= 3612

Out[ ]= 2093

Out[ ]= 264

Out[ ]= 2399

Out[ ]= 3126

Out[ ]= 2490

Out[ ]= 177

Out[ ]= 2532

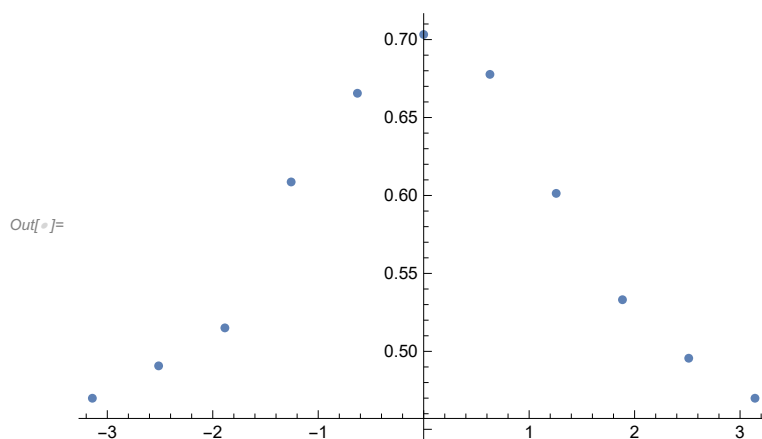
Out[ ]= 2653

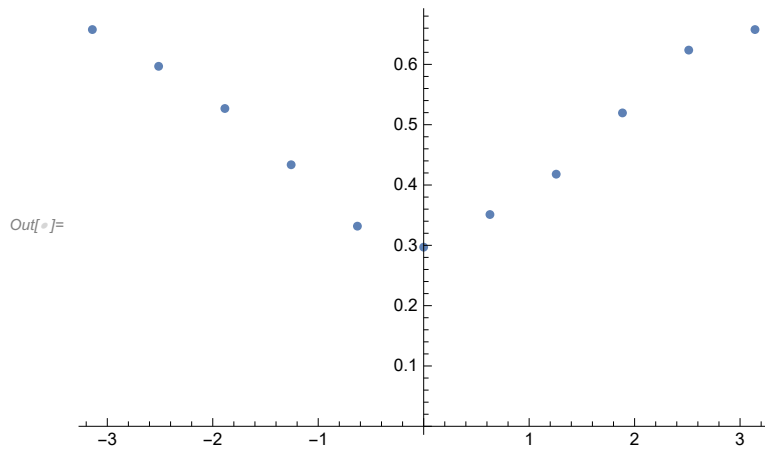
Out[ ]= 2856

Out[ ]= 151

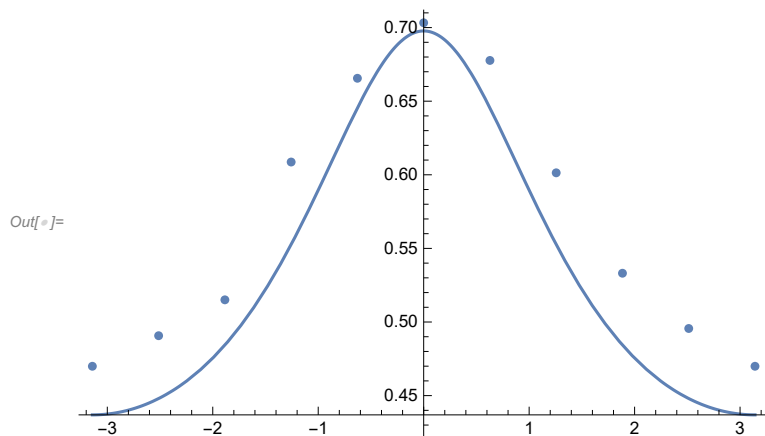
Out[ ]=  $\left\{ \left\{ -\pi, \frac{211}{449} \right\}, \left\{ -2.51327, \frac{2399}{4889} \right\}, \left\{ -1.88496, \frac{171}{332} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1081}{1776} \right\}, \left\{ -0.628319, \frac{201}{302} \right\}, \left\{ 0., \frac{1711}{2433} \right\}, \left\{ 0.628319, \frac{1949}{2876} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{2059}{3424} \right\}, \left\{ 1.88496, \frac{2269}{4256} \right\}, \left\{ 2.51327, \frac{844}{1703} \right\}, \left\{ \pi, \frac{211}{449} \right\} \right\}$

Out[ ]=  $\left\{ \left\{ -\pi, \frac{1347}{2048} \right\}, \left\{ -2.51327, \frac{4889}{8192} \right\}, \left\{ -1.88496, \frac{1079}{2048} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{111}{256} \right\}, \left\{ -0.628319, \frac{1359}{4096} \right\}, \left\{ 0., \frac{2433}{8192} \right\}, \left\{ 0.628319, \frac{719}{2048} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{107}{256} \right\}, \left\{ 1.88496, \frac{133}{256} \right\}, \left\{ 2.51327, \frac{5109}{8192} \right\}, \left\{ 3.14159, \frac{1347}{2048} \right\} \right\}$

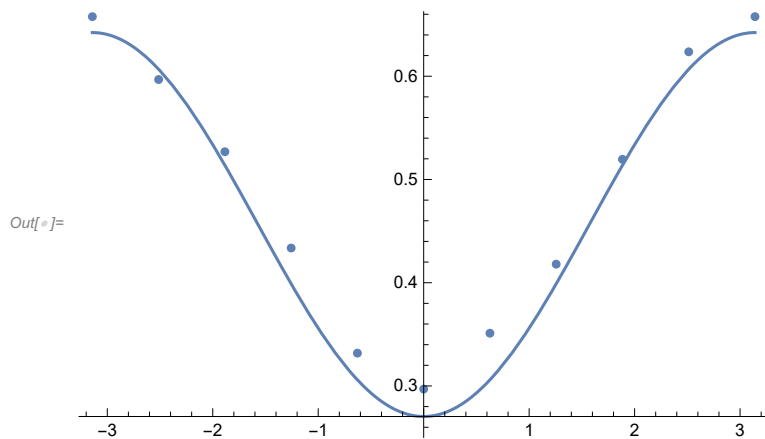




In[ ]:= Show[cosTH, ExpCosSqibmqlima]



In[ ]:= Show[decTH, ExpDecisivenessibmqlima]



In[ ]:= (\*ibmq\_qasm\_simulator\*)

ZeroZeroFirst10ibmqqasmsimulator = 2196

ZeroOneFirst10ibmqqasmsimulator = 2967

OneZeroFirst10ibmqqasmsimulator = 2949

OneOneFirst10ibmqqasmsimulator = 80

ZeroZeroFirst08ibmqqasmsimulator = 2217

```
ZeroOneFirst08ibmqqasmsimulator = 3073
OneZeroFirst08ibmqqasmsimulator = 2790
OneOneFirst08ibmqqasmsimulator = 112
```

```
ZeroZeroFirst06ibmqqasmsimulator = 2093
ZeroOneFirst06ibmqqasmsimulator = 3729
OneZeroFirst06ibmqqasmsimulator = 2152
OneOneFirst06ibmqqasmsimulator = 218
```

```
ZeroZeroFirst04ibmqqasmsimulator = 1792
ZeroOneFirst04ibmqqasmsimulator = 4598
OneZeroFirst04ibmqqasmsimulator = 1451
OneOneFirst04ibmqqasmsimulator = 351
```

```
ZeroZeroFirst02ibmqqasmsimulator = 1576
ZeroOneFirst02ibmqqasmsimulator = 5220
OneZeroFirst02ibmqqasmsimulator = 918
OneOneFirst02ibmqqasmsimulator = 478
```

```
ZeroZeroFirst00ibmqqasmsimulator = 1578
ZeroOneFirst00ibmqqasmsimulator = 5455
OneZeroFirst00ibmqqasmsimulator = 669
OneOneFirst00ibmqqasmsimulator = 490
```

```
ZeroZeroSecond02ibmqqasmsimulator = 1640
ZeroOneSecond02ibmqqasmsimulator = 5228
OneZeroSecond02ibmqqasmsimulator = 900
OneOneSecond02ibmqqasmsimulator = 424
```

```
ZeroZeroSecond04ibmqqasmsimulator = 1851
ZeroOneSecond04ibmqqasmsimulator = 4558
OneZeroSecond04ibmqqasmsimulator = 1436
OneOneSecond04ibmqqasmsimulator = 347
```

```
ZeroZeroSecond06ibmqqasmsimulator = 2031
ZeroOneSecond06ibmqqasmsimulator = 3800
OneZeroSecond06ibmqqasmsimulator = 2109
OneOneSecond06ibmqqasmsimulator = 252
```

```
ZeroZeroSecond08ibmqqasmsimulator = 2261
ZeroOneSecond08ibmqqasmsimulator = 3096
OneZeroSecond08ibmqqasmsimulator = 2710
OneOneSecond08ibmqqasmsimulator = 125
```

```
ZeroZeroSecond10ibmqqasmsimulator = 2196
ZeroOneSecond10ibmqqasmsimulator = 2967
OneZeroSecond10ibmqqasmsimulator = 2949
OneOneSecond10ibmqqasmsimulator = 80
```

```
CosSqibmqqasmsimulator = {{-1 *  $\pi$ , ZeroZeroSecond10ibmqqasmsimulator /
  (OneZeroSecond10ibmqqasmsimulator + ZeroZeroSecond10ibmqqasmsimulator)},
```



```

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

```

Out[ ]= 2196

Out[ ]= 2967

Out[ ]= 2949

Out[ ]= 80

Out[ ]= 2217

Out[ ]= 3073

Out[ ]= 2790

Out[ ]= 112

Out[ ]= 2093

Out[ ]= 3729

Out[ ]= 2152

Out[ ]= 218

Out[ ]= 1792

Out[ ]= 4598

Out[ ]= 1451

Out[ ]= 351

Out[ ]= 1576

Out[ ]= 5220

Out[ ]= 918

Out[ ]= 478

Out[ ]= 1578

Out[ ]= 5455

Out[ ]= 669

Out[ ]= 490

Out[ ]= 1640

Out[ ]= 5228

Out[ ]= 900

Out[ ]= 424

Out[ ]= 1851

Out[ ]= 4558

Out[ ]= 1436

Out[ ]= 347

Out[ ]= 2031

Out[ ]= 3800

Out[ ]= 2109

Out[ ]= 252

Out[ ]= 2261

Out[ ]= 3096

Out[ ]= 2710

Out[ ]= 125

Out[ ]= 2196

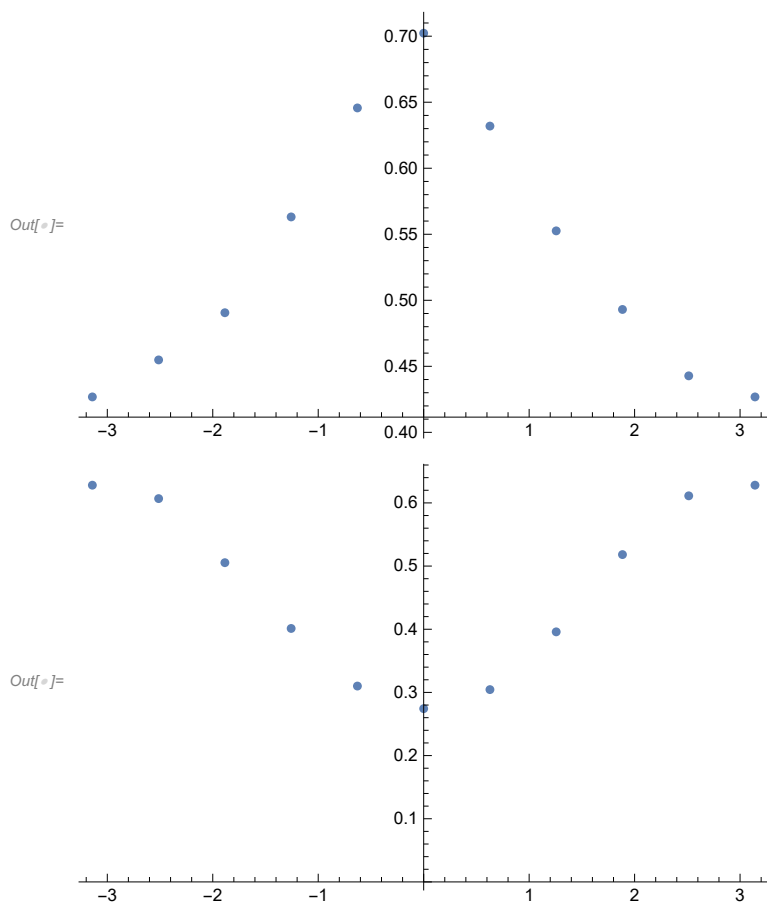
Out[ ]= 2967

Out[ ]= 2949

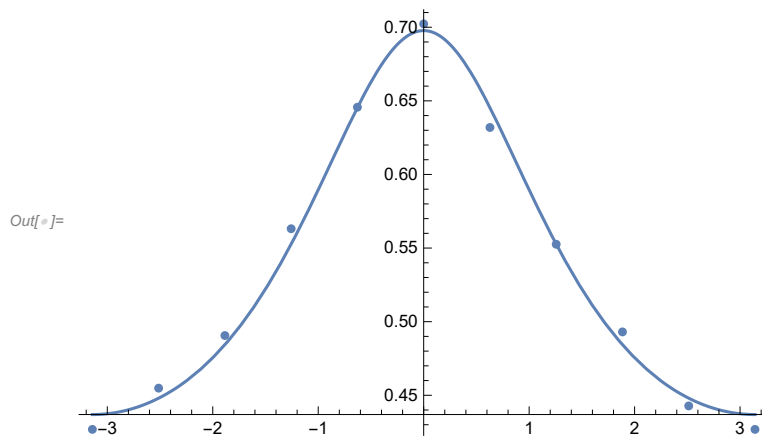
Out[ ]= 80

Out[ ]=  $\left\{ \left\{ -\pi, \frac{732}{1715} \right\}, \left\{ -2.51327, \frac{2261}{4971} \right\}, \left\{ -1.88496, \frac{677}{1380} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1851}{3287} \right\}, \left\{ -0.628319, \frac{82}{127} \right\}, \left\{ 0., \frac{526}{749} \right\}, \left\{ 0.628319, \frac{788}{1247} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{1792}{3243} \right\}, \left\{ 1.88496, \frac{2093}{4245} \right\}, \left\{ 2.51327, \frac{739}{1669} \right\}, \left\{ \pi, \frac{732}{1715} \right\} \right\}$

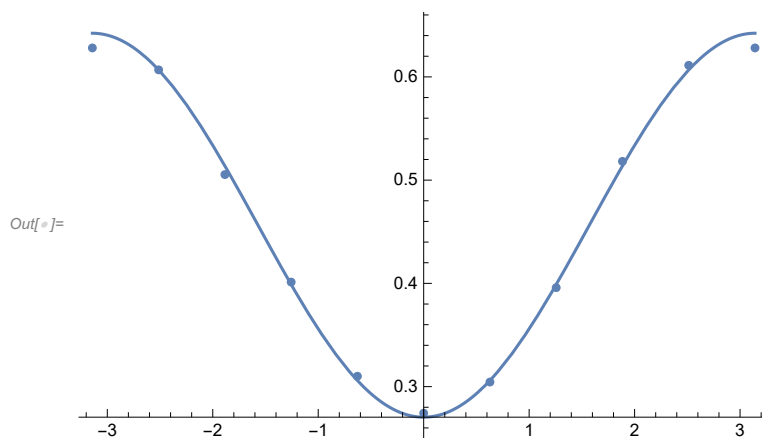
Out[ ]=  $\left\{ \left\{ -\pi, \frac{5145}{8192} \right\}, \left\{ -2.51327, \frac{4971}{8192} \right\}, \left\{ -1.88496, \frac{1035}{2048} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3287}{8192} \right\}, \left\{ -0.628319, \frac{635}{2048} \right\}, \left\{ 0., \frac{2247}{8192} \right\}, \left\{ 0.628319, \frac{1247}{4096} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3243}{8192} \right\}, \left\{ 1.88496, \frac{4245}{8192} \right\}, \left\{ 2.51327, \frac{5007}{8192} \right\}, \left\{ 3.14159, \frac{5145}{8192} \right\} \right\}$



```
In[ ]:= Show[cosTH, ExpCosSqibmqqasmsimulator]
```



```
In[ ]:= Show[decTH, ExpDecisivenessibmqqasmsimulator]
```



```
In[ ]:= (*ibmq_belem*)
```

```
ZeroZeroFirst10ibmqbelem = 2458
ZeroOneFirst10ibmqbelem = 2787
OneZeroFirst10ibmqbelem = 2480
OneOneFirst10ibmqbelem = 467
```

```
ZeroZeroFirst08ibmqbelem = 2389
ZeroOneFirst08ibmqbelem = 3030
OneZeroFirst08ibmqbelem = 2193
OneOneFirst08ibmqbelem = 580
```

```
ZeroZeroFirst06ibmqbelem = 2246
ZeroOneFirst06ibmqbelem = 3565
OneZeroFirst06ibmqbelem = 1685
OneOneFirst06ibmqbelem = 696
```

```
ZeroZeroFirst04ibmqbelem = 2007
ZeroOneFirst04ibmqbelem = 4092
OneZeroFirst04ibmqbelem = 1349
OneOneFirst04ibmqbelem = 744
```

ZeroZeroFirst02ibmqbelem = 1840  
 ZeroOneFirst02ibmqbelem = 4443  
 OneZeroFirst02ibmqbelem = 1105  
 OneOneFirst02ibmqbelem = 804

ZeroZeroFirst00ibmqbelem = 1732  
 ZeroOneFirst00ibmqbelem = 4892  
 OneZeroFirst00ibmqbelem = 891  
 OneOneFirst00ibmqbelem = 677

ZeroZeroSecond02ibmqbelem = 1785  
 ZeroOneSecond02ibmqbelem = 4622  
 OneZeroSecond02ibmqbelem = 1165  
 OneOneSecond02ibmqbelem = 620

ZeroZeroSecond04ibmqbelem = 1887  
 ZeroOneSecond04ibmqbelem = 4126  
 OneZeroSecond04ibmqbelem = 1623  
 OneOneSecond04ibmqbelem = 556

ZeroZeroSecond06ibmqbelem = 2125  
 ZeroOneSecond06ibmqbelem = 3620  
 OneZeroSecond06ibmqbelem = 2047  
 OneOneSecond06ibmqbelem = 400

ZeroZeroSecond08ibmqbelem = 2288  
 ZeroOneSecond08ibmqbelem = 3232  
 OneZeroSecond08ibmqbelem = 2319  
 OneOneSecond08ibmqbelem = 353

ZeroZeroSecond10ibmqbelem = 2458  
 ZeroOneSecond10ibmqbelem = 2787  
 OneZeroSecond10ibmqbelem = 2480  
 OneOneSecond10ibmqbelem = 467

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

```
{ {-1 *  $\pi$ , (OneZeroSecond10ibmqbelem + ZeroZeroSecond10ibmqbelem) / 8192},
  {-0.8 *  $\pi$ , (OneZeroSecond08ibmqbelem + ZeroZeroSecond08ibmqbelem) / 8192},
  {-0.6 *  $\pi$ , (OneZeroSecond06ibmqbelem + ZeroZeroSecond06ibmqbelem) / 8192},
  {-0.4 *  $\pi$ , (OneZeroSecond04ibmqbelem + ZeroZeroSecond04ibmqbelem) / 8192},
  {-0.2 *  $\pi$ , (OneZeroSecond02ibmqbelem + ZeroZeroSecond02ibmqbelem) / 8192},
  {-0.0 *  $\pi$ , (OneZeroFirst00ibmqbelem + ZeroZeroFirst00ibmqbelem) / 8192},
  {0.2 *  $\pi$ , (OneZeroFirst02ibmqbelem + ZeroZeroFirst02ibmqbelem) / 8192},
  {0.4 *  $\pi$ , (OneZeroFirst04ibmqbelem + ZeroZeroFirst04ibmqbelem) / 8192},
  {0.6 *  $\pi$ , (OneZeroFirst06ibmqbelem + ZeroZeroFirst06ibmqbelem) / 8192},
  {0.8 *  $\pi$ , (OneZeroFirst08ibmqbelem + ZeroZeroFirst08ibmqbelem) / 8192},
  {1.0 *  $\pi$ , (OneZeroFirst10ibmqbelem + ZeroZeroFirst10ibmqbelem) / 8192}}
```

```
ExpCosSqibmqbelem = ListPlot[CosSqibmqbelem]
```

```
ExpDecisivenessibmqbelem = ListPlot[Decisivenessibmqbelem]
```

```
Out[ ]= 2458
```

```
Out[ ]= 2787
```

```
Out[ ]= 2480
```

```
Out[ ]= 467
```

```
Out[ ]= 2389
```

```
Out[ ]= 3030
```

```
Out[ ]= 2193
```

```
Out[ ]= 580
```

```
Out[ ]= 2246
```

```
Out[ ]= 3565
```

```
Out[ ]= 1685
```

```
Out[ ]= 696
```

```
Out[ ]= 2007
```

```
Out[ ]= 4092
```

```
Out[ ]= 1349
```

```
Out[ ]= 744
```

```
Out[ ]= 1840
```

```
Out[ ]= 4443
```

```
Out[ ]= 1105
```

```
Out[ ]= 804
```

```
Out[ ]= 1732
```

```
Out[ ]= 4892
```

$$\text{Out}[*]= 891$$

$$\text{Out}[*]= 677$$

$$\text{Out}[*]= 1785$$

$$\text{Out}[*]= 4622$$

$$\text{Out}[*]= 1165$$

$$\text{Out}[*]= 620$$

$$\text{Out}[*]= 1887$$

$$\text{Out}[*]= 4126$$

$$\text{Out}[*]= 1623$$

$$\text{Out}[*]= 556$$

$$\text{Out}[*]= 2125$$

$$\text{Out}[*]= 3620$$

$$\text{Out}[*]= 2047$$

$$\text{Out}[*]= 400$$

$$\text{Out}[*]= 2288$$

$$\text{Out}[*]= 3232$$

$$\text{Out}[*]= 2319$$

$$\text{Out}[*]= 353$$

$$\text{Out}[*]= 2458$$

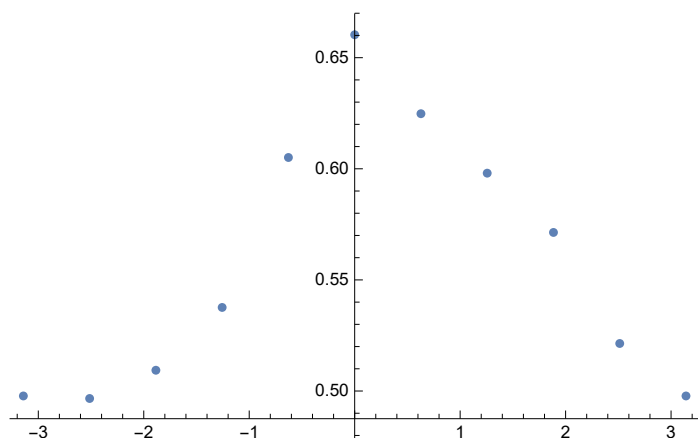
$$\text{Out}[*]= 2787$$

$$\text{Out}[*]= 2480$$

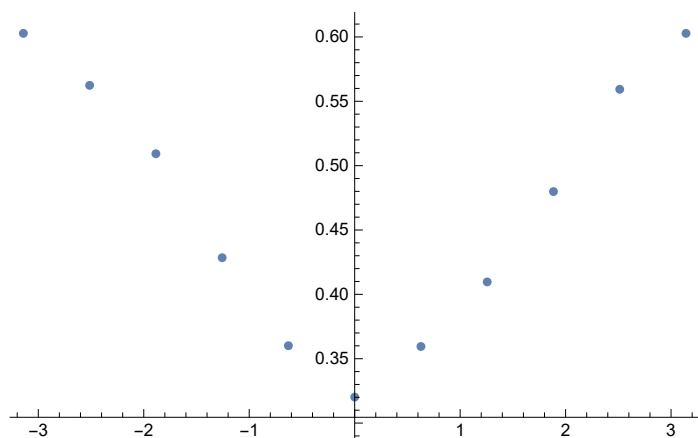
$$\text{Out}[*]= 467$$

$$\begin{aligned} \text{Out}[*]= & \left\{ \left\{ -\pi, \frac{1229}{2469} \right\}, \left\{ -2.51327, \frac{2288}{4607} \right\}, \left\{ -1.88496, \frac{2125}{4172} \right\}, \right. \\ & \left\{ -1.25664, \frac{629}{1170} \right\}, \left\{ -0.628319, \frac{357}{590} \right\}, \left\{ 0., \frac{1732}{2623} \right\}, \left\{ 0.628319, \frac{368}{589} \right\}, \\ & \left. \left\{ 1.25664, \frac{2007}{3356} \right\}, \left\{ 1.88496, \frac{2246}{3931} \right\}, \left\{ 2.51327, \frac{2389}{4582} \right\}, \left\{ \pi, \frac{1229}{2469} \right\} \right\} \\ \text{Out}[*]= & \left\{ \left\{ -\pi, \frac{2469}{4096} \right\}, \left\{ -2.51327, \frac{4607}{8192} \right\}, \left\{ -1.88496, \frac{1043}{2048} \right\}, \right. \\ & \left\{ -1.25664, \frac{1755}{4096} \right\}, \left\{ -0.628319, \frac{1475}{4096} \right\}, \left\{ 0., \frac{2623}{8192} \right\}, \left\{ 0.628319, \frac{2945}{8192} \right\}, \\ & \left. \left\{ 1.25664, \frac{839}{2048} \right\}, \left\{ 1.88496, \frac{3931}{8192} \right\}, \left\{ 2.51327, \frac{2291}{4096} \right\}, \left\{ 3.14159, \frac{2469}{4096} \right\} \right\} \end{aligned}$$

Out[ ]:=

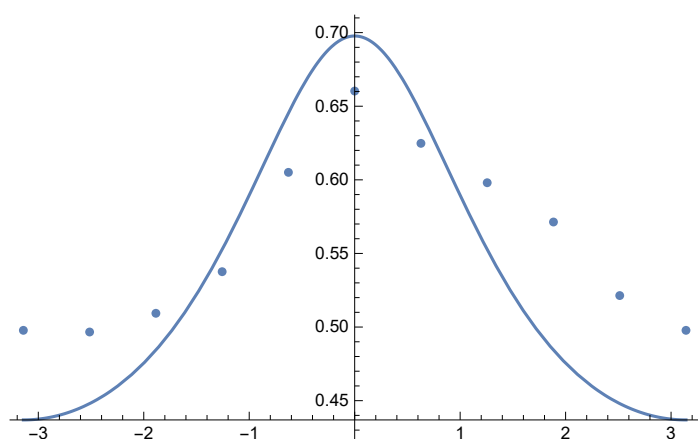


Out[ ]:=



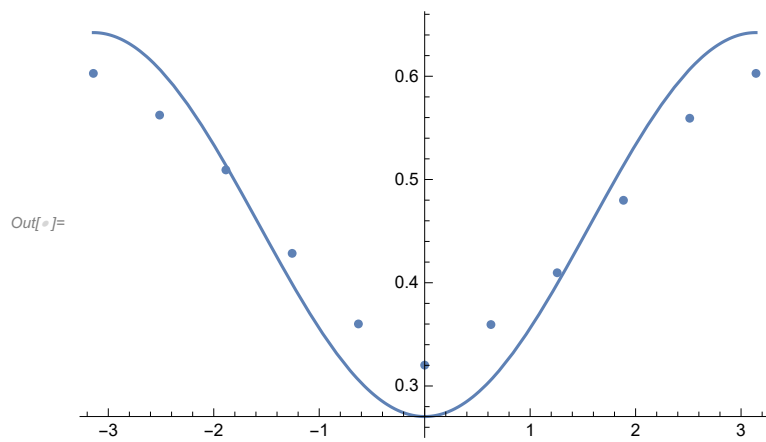
In[ ]:= Show[cosh, ExpCosSqbmqbelem]

Out[ ]:=





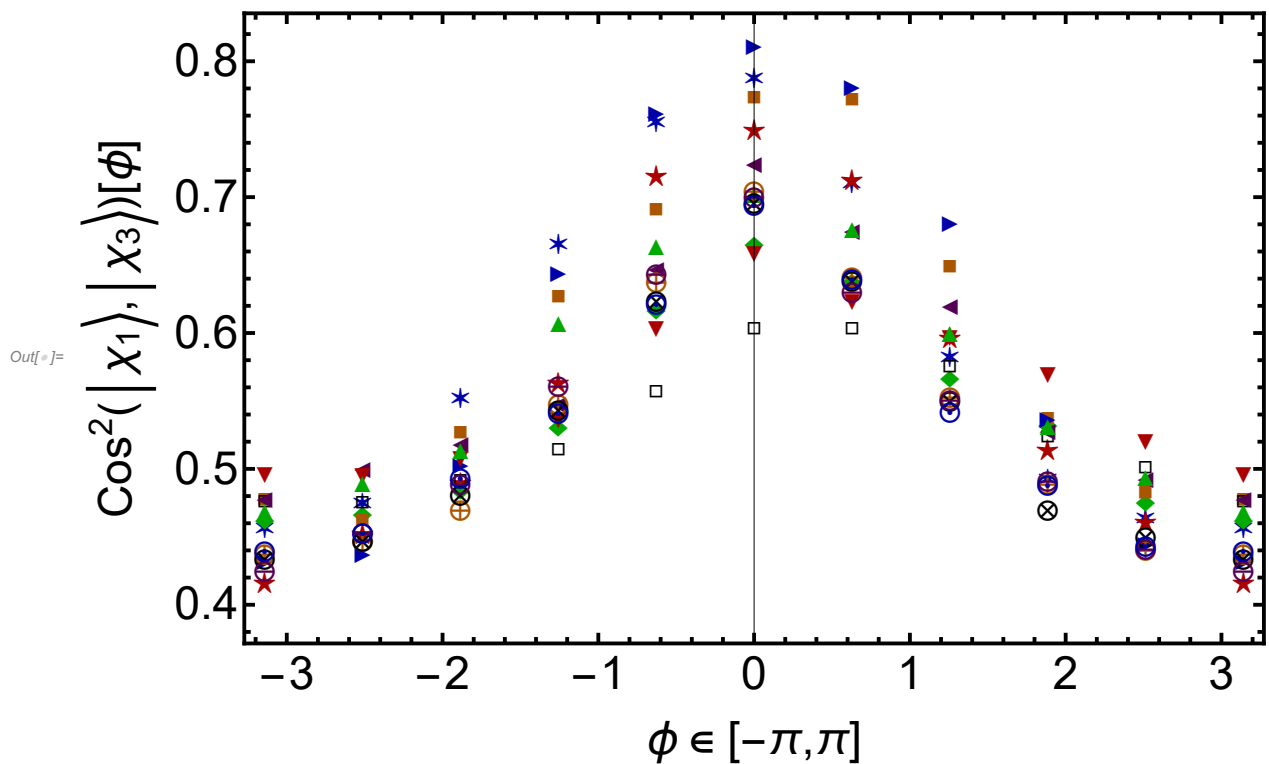
In[ ]:= Show[decTH, ExpDecisivenessibmqbelem]



```

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 -> {{Cos^2(|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}}]

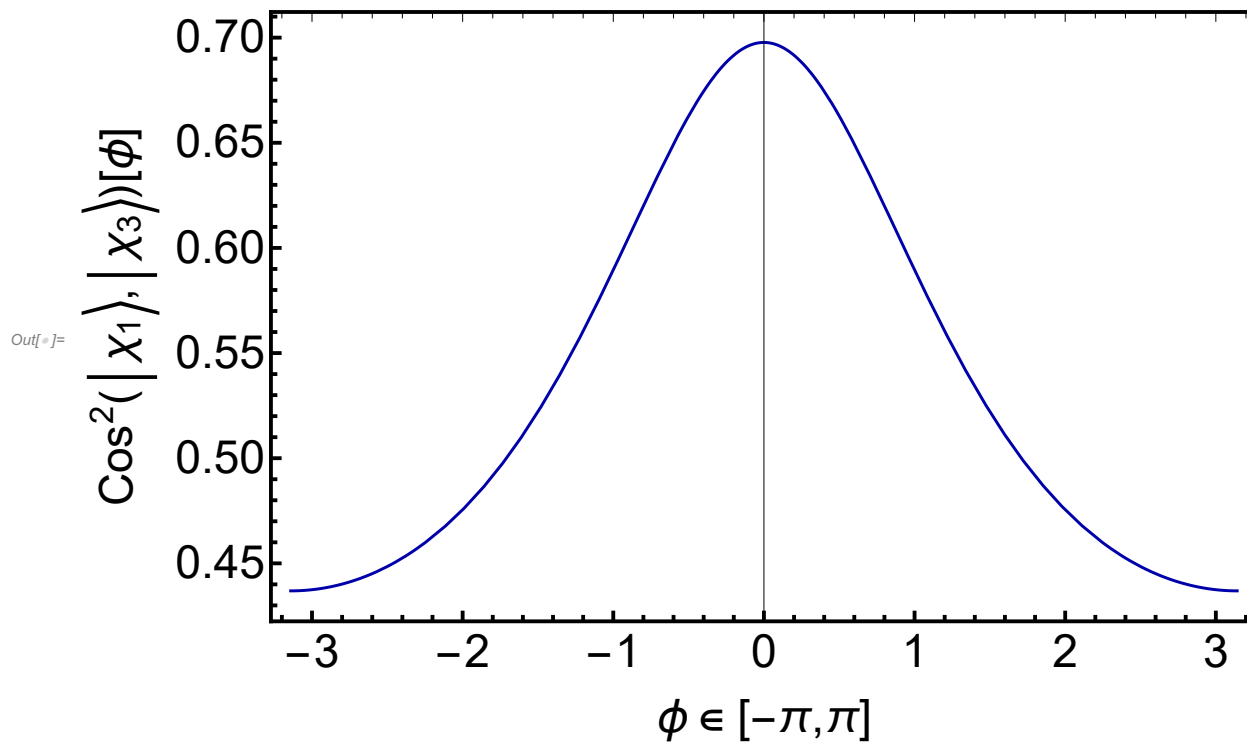
```



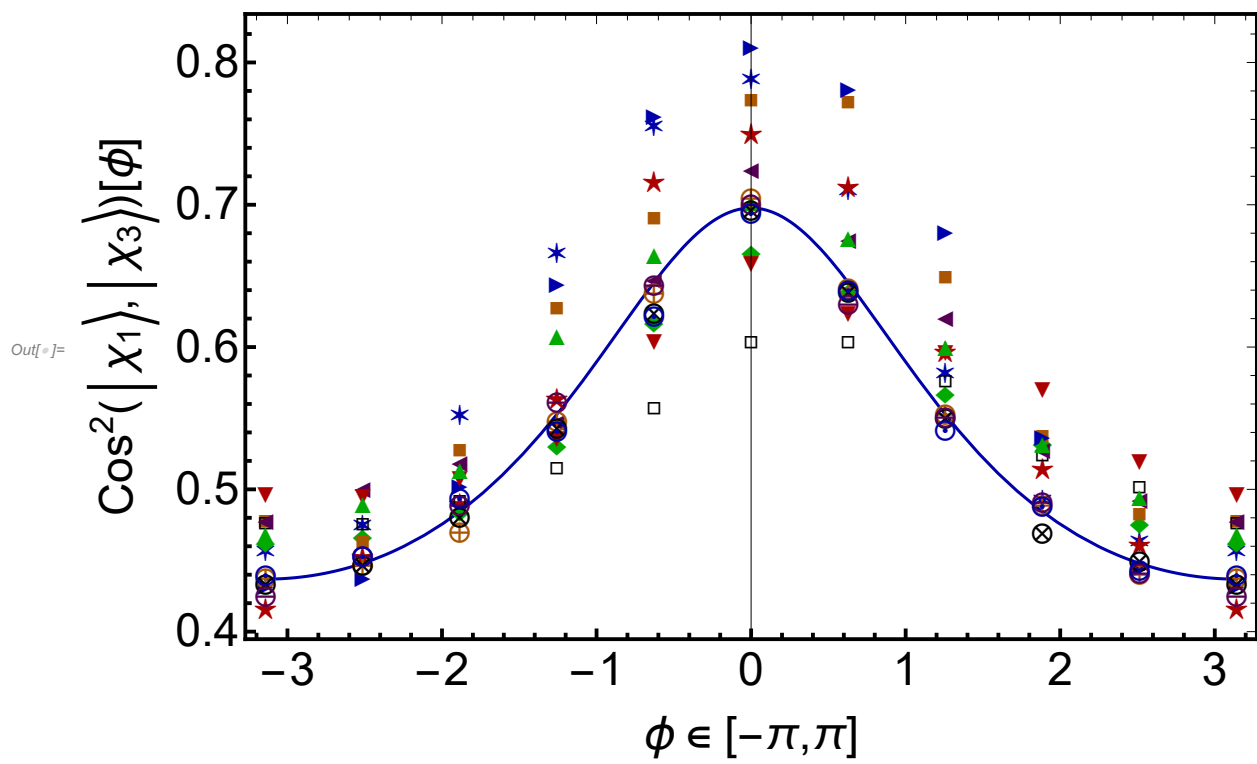
```

In[ ]:= CosSqTheory = Plot[1 - N[cosSecondFunction[-x, 6 / 5,  $\pi/2 - 1$ , 1]], {x, - $\pi$ ,  $\pi$ },
  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 -> {{ $\text{"Cos}^2(|\chi_1\rangle, |\chi_3\rangle)[\phi]$ }, { $\phi \in [-\pi, \pi]$ , ""}},
  LabelStyle -> {FontWeight -> "Bold", FontSize -> 25},
  ImageSize -> 650, GridLinesStyle -> Directive[Thick, Gray]]

```



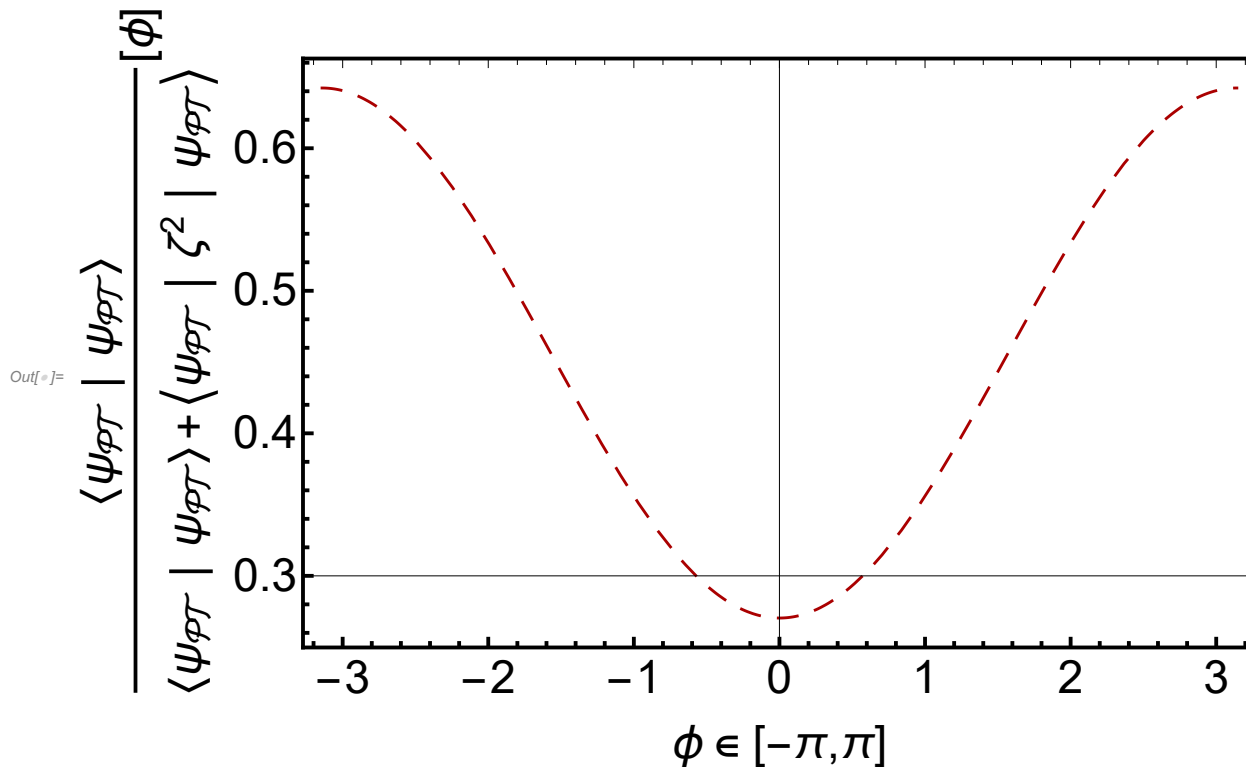
```
In[ ]:= p1 = Show[CosSqTheory, CosSqExperiment, PlotRange -> All]
```



```

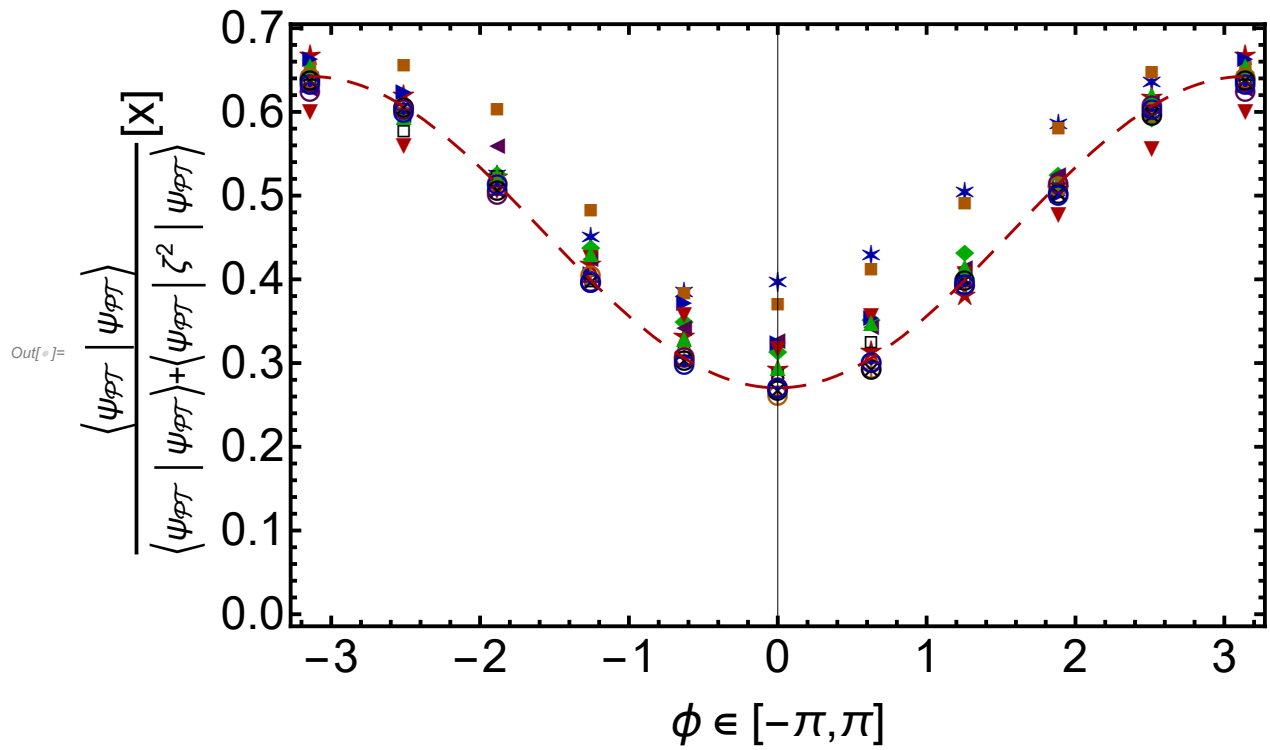
In[ ]:= DecisivenessTheory = Plot[DecisivenessSecondFunction[-x, 6/5, π/2 - 1, 2], {x, -π, π},
  PlotRange → All, PlotStyle → {Directive[Darker[Red], Dashing[0.02], Thickness[0.003]]},
  Frame → True, FrameStyle → Directive[Black, Thick], Frame → True,
  FrameStyle → Directive[Black, Thick], LabelStyle → Large,
  PlotStyle → {Directive[Darker[Green], Thickness[0.007]]},
  FrameLabel → {{
    
$$\frac{\langle \psi_{\phi_T} | \psi_{\phi_T} \rangle}{\langle \psi_{\phi_T} | \psi_{\phi_T} \rangle + \langle \psi_{\phi_T} | \xi^2 | \psi_{\phi_T} \rangle} [\phi], \{ \phi \in [-\pi, \pi], "" \}},
  LabelStyle → {FontWeight → "Bold", FontSize → 25},
  ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]$$

```





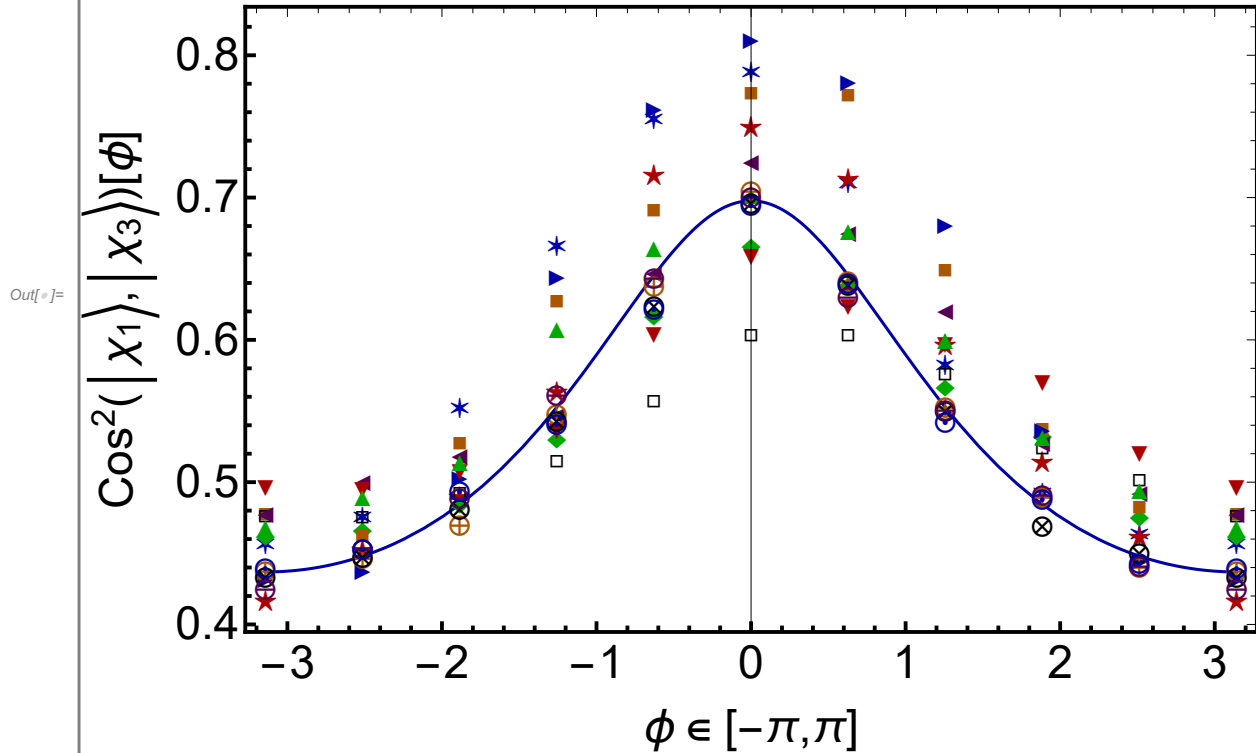
In[ ]:= p2 = Show[DecisivenessExperiment, DecisivenessTheory, PlotRange -> All]



```

In[ ]:= title = Panel[Style["First stage,  $\sigma = \frac{6}{5}$ ,  $\Delta = \frac{\sigma}{2}$ ,  $\alpha = \frac{\pi}{2} - 1$ ,  $\mathcal{N}(\theta) \approx \mathcal{N}_{\min}$ ", White, 20],
ImageSize → 500, Background → Blue, Alignment → Center];
DependenceVariation = Deploy@Grid[{{title, SpanFromLeft}}, {p1, p2}},
Dividers → Gray, Spacings → {0, 0}]

```



```

In[ ]:= Export["First65Two_8_9_2023.png", DependenceVariation, ImageSize → 10 000]

```

Out[ ]:= First65Two\_8\_9\_2023.png

```

In[ ]:= (*ibm_perth*)
ZeroZeroFirst10ibmperth = 2406
ZeroOneFirst10ibmperth = 2723
OneZeroFirst10ibmperth = 2859
OneOneFirst10ibmperth = 204

```

```

ZeroZeroFirst08ibmperth = 2420
ZeroOneFirst08ibmperth = 2770
OneZeroFirst08ibmperth = 2795
OneOneFirst08ibmperth = 207

```

```

ZeroZeroFirst06ibmperth = 2369
ZeroOneFirst06ibmperth = 3140
OneZeroFirst06ibmperth = 2439

```



OneOneFirst06ibmperth = 244

ZeroZeroFirst04ibmperth = 2410

ZeroOneFirst04ibmperth = 3707

OneZeroFirst04ibmperth = 1727

OneOneFirst04ibmperth = 348

ZeroZeroFirst02ibmperth = 2502

ZeroOneFirst02ibmperth = 4168

OneZeroFirst02ibmperth = 1018

OneOneFirst02ibmperth = 504

ZeroZeroFirst00ibmperth = 2565

ZeroOneFirst00ibmperth = 4349

OneZeroFirst00ibmperth = 688

OneOneFirst00ibmperth = 590

ZeroZeroSecond02ibmperth = 2384

ZeroOneSecond02ibmperth = 4409

OneZeroSecond02ibmperth = 771

OneOneSecond02ibmperth = 628

ZeroZeroSecond04ibmperth = 2466

ZeroOneSecond04ibmperth = 3920

OneZeroSecond04ibmperth = 1235

OneOneSecond04ibmperth = 571

ZeroZeroSecond06ibmperth = 2377

ZeroOneSecond06ibmperth = 3430

OneZeroSecond06ibmperth = 1926

OneOneSecond06ibmperth = 459

ZeroZeroSecond08ibmperth = 2341

ZeroOneSecond08ibmperth = 3004

OneZeroSecond08ibmperth = 2580

OneOneSecond08ibmperth = 267

ZeroZeroSecond10ibmperth = 2406

ZeroOneSecond10ibmperth = 2723

OneZeroSecond10ibmperth = 2859

OneOneSecond10ibmperth = 204

CosSqibmperth =

$$\begin{aligned} & \left\{ \{-1 * \pi, \text{ZeroZeroSecond10ibmperth} / (\text{OneZeroSecond10ibmperth} + \text{ZeroZeroSecond10ibmperth})\}, \right. \\ & \left\{ -0.8 * \pi, \text{ZeroZeroSecond08ibmperth} / \right. \\ & \quad \left. (\text{OneZeroSecond08ibmperth} + \text{ZeroZeroSecond08ibmperth}) \right\}, \left\{ -0.6 * \pi, \right. \\ & \quad \left. \text{ZeroZeroSecond06ibmperth} / (\text{OneZeroSecond06ibmperth} + \text{ZeroZeroSecond06ibmperth}) \right\}, \\ & \left\{ -0.4 * \pi, \text{ZeroZeroSecond04ibmperth} / \right. \\ & \quad \left. (\text{OneZeroSecond04ibmperth} + \text{ZeroZeroSecond04ibmperth}) \right\}, \left\{ -0.2 * \pi, \right. \\ & \quad \left. \text{ZeroZeroSecond02ibmperth} / (\text{OneZeroSecond02ibmperth} + \text{ZeroZeroSecond02ibmperth}) \right\}, \\ & \left. \left\{ 0.0 * \pi, \text{ZeroZeroFirst00ibmperth} / (\text{OneZeroFirst00ibmperth} + \text{ZeroZeroFirst00ibmperth}) \right\}, \right. \end{aligned}$$

```

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

```

Out[ ]= 2406

Out[ ]= 2723

Out[ ]= 2859

Out[ ]= 204

Out[ ]= 2420

Out[ ]= 2770

Out[ ]= 2795

Out[ ]= 207

Out[ ]= 2369

Out[ ]= 3140

Out[ ]= 2439

Out[ ]= 244

Out[ ]= 2410

Out[ ]= 3707

Out[ ]= 1727

Out[ ]= 348

$Out[ \ast ] = 2502$

$Out[ \ast ] = 4168$

$Out[ \ast ] = 1018$

$Out[ \ast ] = 504$

$Out[ \ast ] = 2565$

$Out[ \ast ] = 4349$

$Out[ \ast ] = 688$

$Out[ \ast ] = 590$

$Out[ \ast ] = 2384$

$Out[ \ast ] = 4409$

$Out[ \ast ] = 771$

$Out[ \ast ] = 628$

$Out[ \ast ] = 2466$

$Out[ \ast ] = 3920$

$Out[ \ast ] = 1235$

$Out[ \ast ] = 571$

$Out[ \ast ] = 2377$

$Out[ \ast ] = 3430$

$Out[ \ast ] = 1926$

$Out[ \ast ] = 459$

$Out[ \ast ] = 2341$

$Out[ \ast ] = 3004$

$Out[ \ast ] = 2580$

$Out[ \ast ] = 267$

$Out[ \ast ] = 2406$

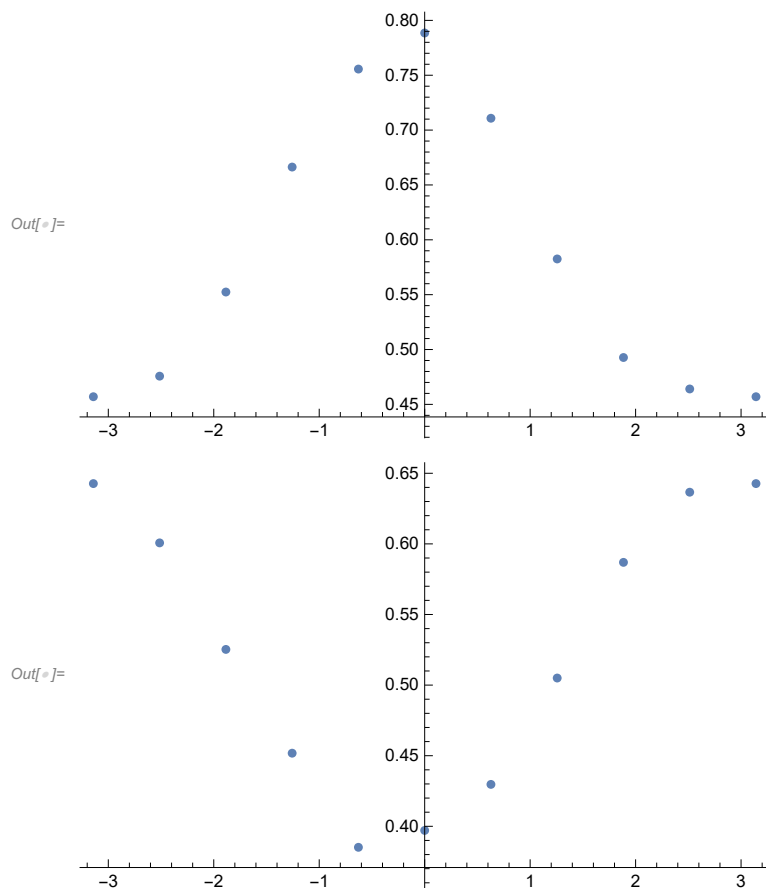
$Out[ \ast ] = 2723$

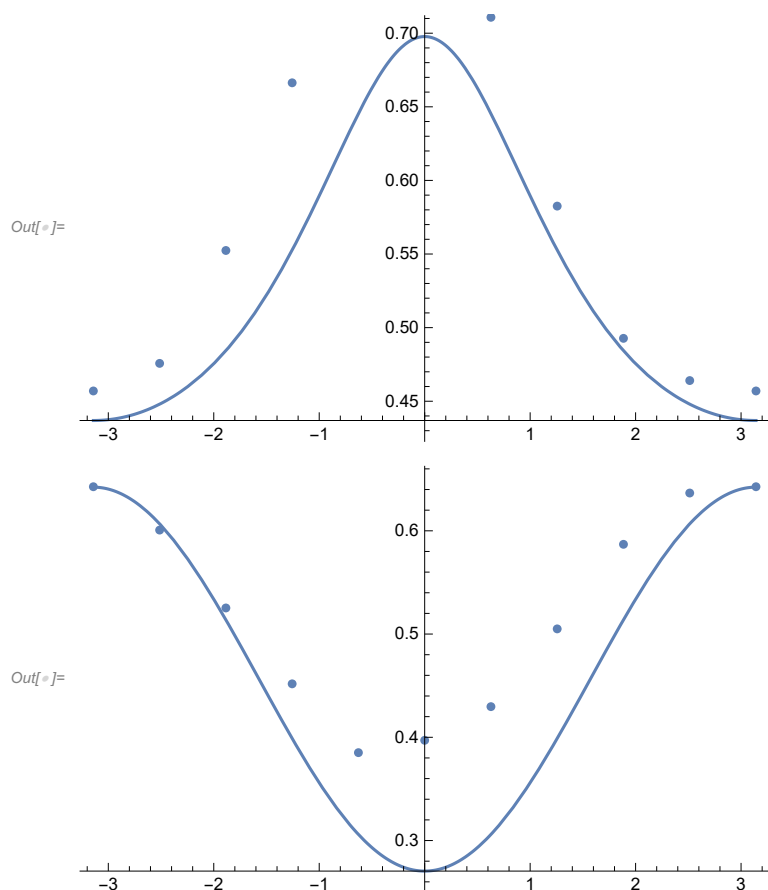
$Out[ \ast ] = 2859$

$Out[ \ast ] = 204$

$$\text{Out}[*]= \left\{ \left\{ -\pi, \frac{802}{1755} \right\}, \left\{ -2.51327, \frac{2341}{4921} \right\}, \left\{ -1.88496, \frac{2377}{4303} \right\}, \right. \\ \left. \left\{ -1.25664, \frac{2466}{3701} \right\}, \left\{ -0.628319, \frac{2384}{3155} \right\}, \left\{ 0., \frac{2565}{3253} \right\}, \left\{ 0.628319, \frac{1251}{1760} \right\}, \right. \\ \left. \left\{ 1.25664, \frac{2410}{4137} \right\}, \left\{ 1.88496, \frac{2369}{4808} \right\}, \left\{ 2.51327, \frac{484}{1043} \right\}, \left\{ \pi, \frac{802}{1755} \right\} \right\}$$

$$\text{Out}[*]= \left\{ \left\{ -\pi, \frac{5265}{8192} \right\}, \left\{ -2.51327, \frac{4921}{8192} \right\}, \left\{ -1.88496, \frac{4303}{8192} \right\}, \right. \\ \left. \left\{ -1.25664, \frac{3701}{8192} \right\}, \left\{ -0.628319, \frac{3155}{8192} \right\}, \left\{ 0., \frac{3253}{8192} \right\}, \left\{ 0.628319, \frac{55}{128} \right\}, \right. \\ \left. \left\{ 1.25664, \frac{4137}{8192} \right\}, \left\{ 1.88496, \frac{601}{1024} \right\}, \left\{ 2.51327, \frac{5215}{8192} \right\}, \left\{ 3.14159, \frac{5265}{8192} \right\} \right\}$$





```
In[ ]:= (*ibmq_jakarta*)
ZeroZeroFirst10ibmqjakarta = 2283
ZeroOneFirst10ibmqjakarta = 2586
OneZeroFirst10ibmqjakarta = 3196
OneOneFirst10ibmqjakarta = 127
```

```
ZeroZeroFirst08ibmqjakarta = 2338
ZeroOneFirst08ibmqjakarta = 2953
OneZeroFirst08ibmqjakarta = 2727
OneOneFirst08ibmqjakarta = 174
```

```
ZeroZeroFirst06ibmqjakarta = 2142
ZeroOneFirst06ibmqjakarta = 3649
OneZeroFirst06ibmqjakarta = 2021
OneOneFirst06ibmqjakarta = 380
```

```
ZeroZeroFirst04ibmqjakarta = 1867
ZeroOneFirst04ibmqjakarta = 4609
OneZeroFirst04ibmqjakarta = 1260
OneOneFirst04ibmqjakarta = 456
```

```
ZeroZeroFirst02ibmqjakarta = 1841
ZeroOneFirst02ibmqjakarta = 5120
OneZeroFirst02ibmqjakarta = 740
```

OneOneFirst02ibmqjakarta = 491

ZeroZeroFirst00ibmqjakarta = 1803

ZeroOneFirst00ibmqjakarta = 5223

OneZeroFirst00ibmqjakarta = 601

OneOneFirst00ibmqjakarta = 565

ZeroZeroSecond02ibmqjakarta = 1953

ZeroOneSecond02ibmqjakarta = 5019

OneZeroSecond02ibmqjakarta = 774

OneOneSecond02ibmqjakarta = 446

ZeroZeroSecond04ibmqjakarta = 1938

ZeroOneSecond04ibmqjakarta = 4399

OneZeroSecond04ibmqjakarta = 1500

OneOneSecond04ibmqjakarta = 355

ZeroZeroSecond06ibmqjakarta = 2102

ZeroOneSecond06ibmqjakarta = 3664

OneZeroSecond06ibmqjakarta = 2185

OneOneSecond06ibmqjakarta = 241

ZeroZeroSecond08ibmqjakarta = 2305

ZeroOneSecond08ibmqjakarta = 2934

OneZeroSecond08ibmqjakarta = 2785

OneOneSecond08ibmqjakarta = 168

ZeroZeroSecond10ibmqjakarta = 2283

ZeroOneSecond10ibmqjakarta = 2586

OneZeroSecond10ibmqjakarta = 3196

OneOneSecond10ibmqjakarta = 127

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

```

Decisivenessibmqjakarta = {{-1 *  $\pi$ ,
  (OneZeroSecond10ibmqjakarta + ZeroZeroSecond10ibmqjakarta) / 8192},
  {-0.8 *  $\pi$ , (OneZeroSecond08ibmqjakarta + ZeroZeroSecond08ibmqjakarta) / 8192},
  {-0.6 *  $\pi$ , (OneZeroSecond06ibmqjakarta + ZeroZeroSecond06ibmqjakarta) / 8192},
  {-0.4 *  $\pi$ , (OneZeroSecond04ibmqjakarta + ZeroZeroSecond04ibmqjakarta) / 8192},
  {-0.2 *  $\pi$ , (OneZeroSecond02ibmqjakarta + ZeroZeroSecond02ibmqjakarta) / 8192},
  {-0.0 *  $\pi$ , (OneZeroFirst00ibmqjakarta + ZeroZeroFirst00ibmqjakarta) / 8192},
  {0.2 *  $\pi$ , (OneZeroFirst02ibmqjakarta + ZeroZeroFirst02ibmqjakarta) / 8192},
  {0.4 *  $\pi$ , (OneZeroFirst04ibmqjakarta + ZeroZeroFirst04ibmqjakarta) / 8192},
  {0.6 *  $\pi$ , (OneZeroFirst06ibmqjakarta + ZeroZeroFirst06ibmqjakarta) / 8192},
  {0.8 *  $\pi$ , (OneZeroFirst08ibmqjakarta + ZeroZeroFirst08ibmqjakarta) / 8192},
  {1.0 *  $\pi$ , (OneZeroFirst10ibmqjakarta + ZeroZeroFirst10ibmqjakarta) / 8192}}
ExpCosSqibmqjakarta = ListPlot[CosSqibmqjakarta]
ExpDecisivenessibmqjakarta = ListPlot[Decisivenessibmqjakarta]
Show[costH, ExpCosSqibmqjakarta]
Show[decTH, ExpDecisivenessibmqjakarta]
(*ibm_lagos*)
ZeroZeroFirst10ibmlagos = 2455
ZeroOneFirst10ibmlagos = 2642
OneZeroFirst10ibmlagos = 2842
OneOneFirst10ibmlagos = 253

ZeroZeroFirst08ibmlagos = 2324
ZeroOneFirst08ibmlagos = 3016
OneZeroFirst08ibmlagos = 2550
OneOneFirst08ibmlagos = 302

ZeroZeroFirst06ibmlagos = 2305
ZeroOneFirst06ibmlagos = 3523
OneZeroFirst06ibmlagos = 2017
OneOneFirst06ibmlagos = 347

ZeroZeroFirst04ibmlagos = 2024
ZeroOneFirst04ibmlagos = 4194
OneZeroFirst04ibmlagos = 1537
OneOneFirst04ibmlagos = 437

ZeroZeroFirst02ibmlagos = 1858
ZeroOneFirst02ibmlagos = 4773
OneZeroFirst02ibmlagos = 1046
OneOneFirst02ibmlagos = 515

ZeroZeroFirst00ibmlagos = 1729
ZeroOneFirst00ibmlagos = 5031
OneZeroFirst00ibmlagos = 863
OneOneFirst00ibmlagos = 569

ZeroZeroSecond02ibmlagos = 1786
ZeroOneSecond02ibmlagos = 4700
OneZeroSecond02ibmlagos = 1104

```

OneOneSecond02ibmlagos = 602

ZeroZeroSecond04ibmlagos = 1919

ZeroOneSecond04ibmlagos = 4051

OneZeroSecond04ibmlagos = 1690

OneOneSecond04ibmlagos = 532

ZeroZeroSecond06ibmlagos = 2102

ZeroOneSecond06ibmlagos = 3531

OneZeroSecond06ibmlagos = 2227

OneOneSecond06ibmlagos = 332

ZeroZeroSecond08ibmlagos = 2310

ZeroOneSecond08ibmlagos = 2934

OneZeroSecond08ibmlagos = 2627

OneOneSecond08ibmlagos = 321

ZeroZeroSecond10ibmlagos = 2455

ZeroOneSecond10ibmlagos = 2642

OneZeroSecond10ibmlagos = 2842

OneOneSecond10ibmlagos = 253

CosSqibmlagos =

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

Decisivenessibmlagos =

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

ExpCosSqibmlagos = ListPlot[CosSqibmlagos]



```
ExpDecisivenessibmlagos = ListPlot[Decisivenessibmlagos]
Show[cosTH, ExpCosSqibmlagos, PlotRange → All]
Show[decTH, ExpDecisivenessibmlagos]
```

Out[ ]= 2283

Out[ ]= 2586

Out[ ]= 3196

Out[ ]= 127

Out[ ]= 2338

Out[ ]= 2953

Out[ ]= 2727

Out[ ]= 174

Out[ ]= 2142

Out[ ]= 3649

Out[ ]= 2021

Out[ ]= 380

Out[ ]= 1867

Out[ ]= 4609

Out[ ]= 1260

Out[ ]= 456

Out[ ]= 1841

Out[ ]= 5120

Out[ ]= 740

Out[ ]= 491

Out[ ]= 1803

Out[ ]= 5223

Out[ ]= 601

Out[ ]= 565

Out[ ]= 1953

Out[ ]= 5019

Out[ ]= 774

Out[ ]= 446

Out[ ]= 1938

Out[ ]= 4399

Out[ ]= 1500

Out[ ]= 355

Out[ ]= 2102

Out[ ]= 3664

Out[ ]= 2185

Out[ ]= 241

Out[ ]= 2305

Out[ ]= 2934

Out[ ]= 2785

Out[ ]= 168

Out[ ]= 2283

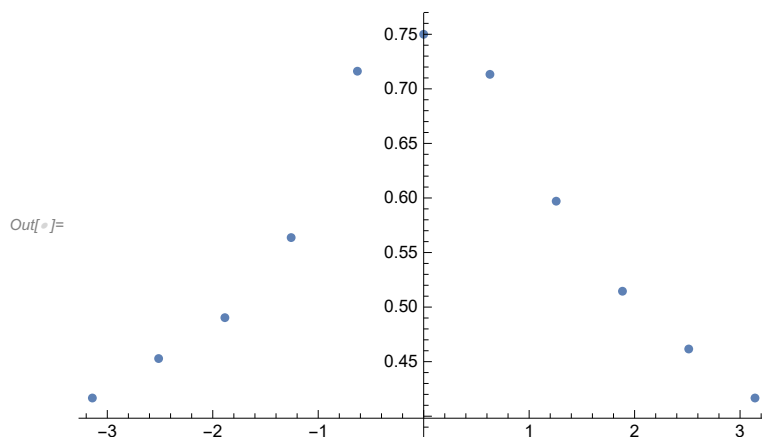
Out[ ]= 2586

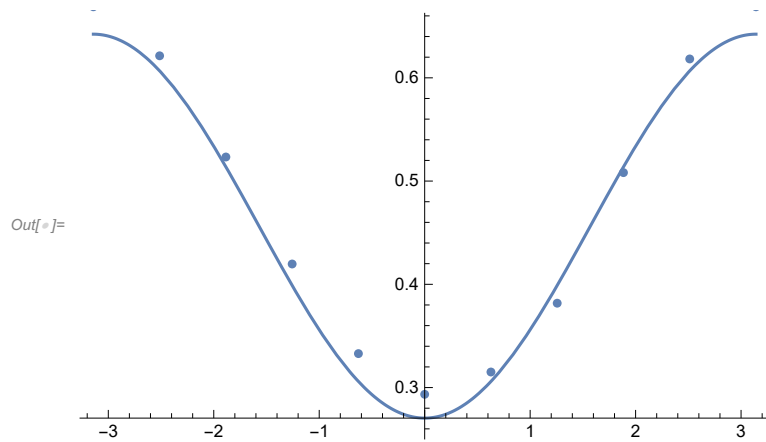
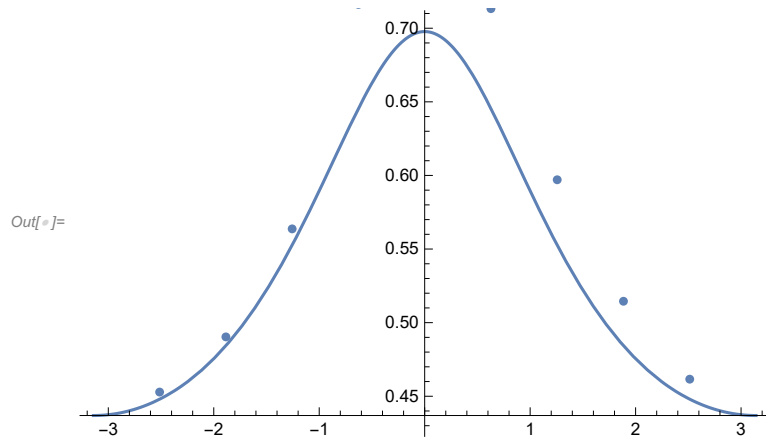
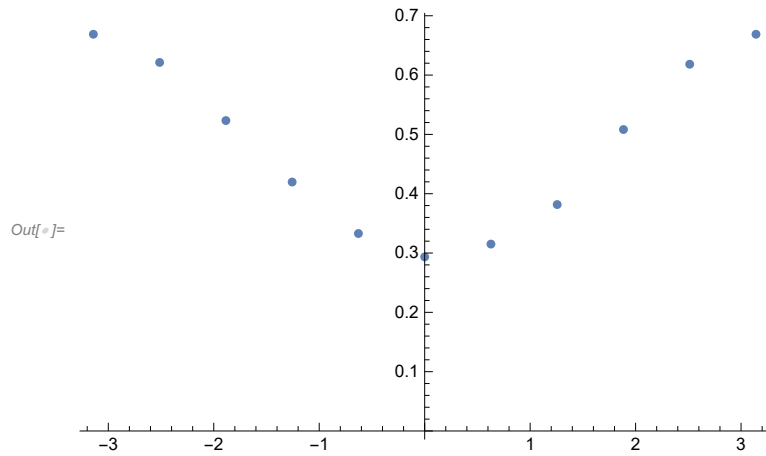
Out[ ]= 3196

Out[ ]= 127

Out[ ]=  $\left\{ \left\{ -\pi, \frac{2283}{5479} \right\}, \left\{ -2.51327, \frac{461}{1018} \right\}, \left\{ -1.88496, \frac{2102}{4287} \right\}, \left\{ -1.25664, \frac{323}{573} \right\}, \left\{ -0.628319, \frac{217}{303} \right\}, \right.$   
 $\left. \left\{ 0., \frac{3}{4} \right\}, \left\{ 0.628319, \frac{1841}{2581} \right\}, \left\{ 1.25664, \frac{1867}{3127} \right\}, \left\{ 1.88496, \frac{2142}{4163} \right\}, \left\{ 2.51327, \frac{2338}{5065} \right\}, \left\{ \pi, \frac{2283}{5479} \right\} \right\}$

Out[ ]=  $\left\{ \left\{ -\pi, \frac{5479}{8192} \right\}, \left\{ -2.51327, \frac{2545}{4096} \right\}, \left\{ -1.88496, \frac{4287}{8192} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1719}{4096} \right\}, \left\{ -0.628319, \frac{2727}{8192} \right\}, \left\{ 0., \frac{601}{2048} \right\}, \left\{ 0.628319, \frac{2581}{8192} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3127}{8192} \right\}, \left\{ 1.88496, \frac{4163}{8192} \right\}, \left\{ 2.51327, \frac{5065}{8192} \right\}, \left\{ 3.14159, \frac{5479}{8192} \right\} \right\}$





Out[ ]= 2455

Out[ ]= 2642

Out[ ]= 2842

Out[ ]= 253

Out[ ]= 2324

Out[ ]= 3016

Out[ ]= 2550

Out[ ]= 302

Out[ ]= 2305

Out[ ]= 3523

Out[ ]= 2017

Out[ ]= 347

Out[ ]= 2024

Out[ ]= 4194

Out[ ]= 1537

Out[ ]= 437

Out[ ]= 1858

Out[ ]= 4773

Out[ ]= 1046

Out[ ]= 515

Out[ ]= 1729

Out[ ]= 5031

Out[ ]= 863

Out[ ]= 569

Out[ ]= 1786

Out[ ]= 4700

Out[ ]= 1104

Out[ ]= 602

Out[ ]= 1919

Out[ ]= 4051

Out[ ]= 1690

Out[ ]= 532

Out[ ]= 2102

Out[ ]= 3531

Out[ ]= 2227

Out[ ]= 332

Out[ ]= 2310

$\text{Out}[\#]= 2934$

$\text{Out}[\#]= 2627$

$\text{Out}[\#]= 321$

$\text{Out}[\#]= 2455$

$\text{Out}[\#]= 2642$

$\text{Out}[\#]= 2842$

$\text{Out}[\#]= 253$

$\text{Out}[\#]= \left\{ \left\{ -\pi, \frac{2455}{5297} \right\}, \left\{ -2.51327, \frac{2310}{4937} \right\}, \left\{ -1.88496, \frac{2102}{4329} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{1919}{3609} \right\}, \left\{ -0.628319, \frac{893}{1445} \right\}, \left\{ 0., \frac{1729}{2592} \right\}, \left\{ 0.628319, \frac{929}{1452} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{2024}{3561} \right\}, \left\{ 1.88496, \frac{2305}{4322} \right\}, \left\{ 2.51327, \frac{1162}{2437} \right\}, \left\{ \pi, \frac{2455}{5297} \right\} \right\}$

$\text{Out}[\#]= \left\{ \left\{ -\pi, \frac{5297}{8192} \right\}, \left\{ -2.51327, \frac{4937}{8192} \right\}, \left\{ -1.88496, \frac{4329}{8192} \right\}, \right.$   
 $\left. \left\{ -1.25664, \frac{3609}{8192} \right\}, \left\{ -0.628319, \frac{1445}{4096} \right\}, \left\{ 0., \frac{81}{256} \right\}, \left\{ 0.628319, \frac{363}{1024} \right\}, \right.$   
 $\left. \left\{ 1.25664, \frac{3561}{8192} \right\}, \left\{ 1.88496, \frac{2161}{4096} \right\}, \left\{ 2.51327, \frac{2437}{4096} \right\}, \left\{ 3.14159, \frac{5297}{8192} \right\} \right\}$

$\text{Out}[\#]=$

