

```

In[ ]:= (*simulator_extended_stabilizer*)
ZeroZeroFirst10simulatorextendedstabilizer = 8180
ZeroOneFirst10simulatorextendedstabilizer = 12
OneZeroFirst10simulatorextendedstabilizer = 0
OneOneFirst10simulatorextendedstabilizer = 0

ZeroZeroFirst08simulatorextendedstabilizer = 7978
ZeroOneFirst08simulatorextendedstabilizer = 3
OneZeroFirst08simulatorextendedstabilizer = 2
OneOneFirst08simulatorextendedstabilizer = 209

ZeroZeroFirst06simulatorextendedstabilizer = 7423
ZeroOneFirst06simulatorextendedstabilizer = 6
OneZeroFirst06simulatorextendedstabilizer = 13
OneOneFirst06simulatorextendedstabilizer = 750

ZeroZeroFirst04simulatorextendedstabilizer = 6477
ZeroOneFirst04simulatorextendedstabilizer = 11
OneZeroFirst04simulatorextendedstabilizer = 34
OneOneFirst04simulatorextendedstabilizer = 1670

ZeroZeroFirst02simulatorextendedstabilizer = 5337
ZeroOneFirst02simulatorextendedstabilizer = 2
OneZeroFirst02simulatorextendedstabilizer = 63
OneOneFirst02simulatorextendedstabilizer = 2790

ZeroZeroFirst00simulatorextendedstabilizer = 4100
ZeroOneFirst00simulatorextendedstabilizer = 6
OneZeroFirst00simulatorextendedstabilizer = 68
OneOneFirst00simulatorextendedstabilizer = 4018

ZeroZeroSecond02simulatorextendedstabilizer = 2690
ZeroOneSecond02simulatorextendedstabilizer = 1
OneZeroSecond02simulatorextendedstabilizer = 91
OneOneSecond02simulatorextendedstabilizer = 5410

ZeroZeroSecond04simulatorextendedstabilizer = 1645
ZeroOneSecond04simulatorextendedstabilizer = 0
OneZeroSecond04simulatorextendedstabilizer = 145
OneOneSecond04simulatorextendedstabilizer = 6402

ZeroZeroSecond06simulatorextendedstabilizer = 812
ZeroOneSecond06simulatorextendedstabilizer = 0
OneZeroSecond06simulatorextendedstabilizer = 134
OneOneSecond06simulatorextendedstabilizer = 7246

ZeroZeroSecond08simulatorextendedstabilizer = 207
ZeroOneSecond08simulatorextendedstabilizer = 0
OneZeroSecond08simulatorextendedstabilizer = 147
OneOneSecond08simulatorextendedstabilizer = 7838

```

```

ZeroZeroSecond10simulatorextendedstabilizer = 0
ZeroOneSecond10simulatorextendedstabilizer = 0
OneZeroSecond10simulatorextendedstabilizer = 148
OneOneSecond10simulatorextendedstabilizer = 8044

```

```

CosSqsimulatorextendedstabilizer =
{ { - (π/2) * 1, ZeroZeroSecond10simulatorextendedstabilizer /
  (OneZeroSecond10simulatorextendedstabilizer +
   ZeroZeroSecond10simulatorextendedstabilizer) },
  { - (π/2) * 0.8, ZeroZeroSecond08simulatorextendedstabilizer /
    (OneZeroSecond08simulatorextendedstabilizer +
     ZeroZeroSecond08simulatorextendedstabilizer) },
  { - (π/2) * 0.6, ZeroZeroSecond06simulatorextendedstabilizer /
    (OneZeroSecond06simulatorextendedstabilizer +
     ZeroZeroSecond06simulatorextendedstabilizer) },
  { - (π/2) * 0.4, ZeroZeroSecond04simulatorextendedstabilizer /
    (OneZeroSecond04simulatorextendedstabilizer +
     ZeroZeroSecond04simulatorextendedstabilizer) },
  { - (π/2) * 0.2, ZeroZeroSecond02simulatorextendedstabilizer /
    (OneZeroSecond02simulatorextendedstabilizer +
     ZeroZeroSecond02simulatorextendedstabilizer) },
  { (π/2) * 0.0, ZeroZeroFirst00simulatorextendedstabilizer /
    (OneZeroFirst00simulatorextendedstabilizer +
     ZeroZeroFirst00simulatorextendedstabilizer) },
  { (π/2) * 0.2, ZeroZeroFirst02simulatorextendedstabilizer /
    (OneZeroFirst02simulatorextendedstabilizer +
     ZeroZeroFirst02simulatorextendedstabilizer) },
  { (π/2) * 0.4, ZeroZeroFirst04simulatorextendedstabilizer /
    (OneZeroFirst04simulatorextendedstabilizer +
     ZeroZeroFirst04simulatorextendedstabilizer) },
  { (π/2) * 0.6, ZeroZeroFirst06simulatorextendedstabilizer /
    (OneZeroFirst06simulatorextendedstabilizer +
     ZeroZeroFirst06simulatorextendedstabilizer) },
  { (π/2) * 0.8, ZeroZeroFirst08simulatorextendedstabilizer /
    (OneZeroFirst08simulatorextendedstabilizer +
     ZeroZeroFirst08simulatorextendedstabilizer) },
  { (π/2) * 1, ZeroZeroFirst10simulatorextendedstabilizer /
    (OneZeroFirst10simulatorextendedstabilizer +
     ZeroZeroFirst10simulatorextendedstabilizer) } }
Decisivenesssimulatorextendedstabilizer = { { - (π/2) * 1,
  (OneZeroSecond10simulatorextendedstabilizer +
   ZeroZeroSecond10simulatorextendedstabilizer) / 8192 },
  { - (π/2) * 0.8, (OneZeroSecond08simulatorextendedstabilizer +
   ZeroZeroSecond08simulatorextendedstabilizer) / 8192 },
  { - (π/2) * 0.6, (OneZeroSecond06simulatorextendedstabilizer +
   ZeroZeroSecond06simulatorextendedstabilizer) / 8192 },
  { - (π/2) * 0.4, (OneZeroSecond04simulatorextendedstabilizer +

```

```

ZeroZeroSecond04simulatorextendedstabilizer) / 8192},
{- (π/2) * 0.2, (OneZeroSecond02simulatorextendedstabilizer +
ZeroZeroSecond02simulatorextendedstabilizer) / 8192},
{- (π/2) * 0.0, (OneZeroFirst00simulatorextendedstabilizer +
ZeroZeroFirst00simulatorextendedstabilizer) / 8192},
{(π/2) * 0.2, (OneZeroFirst02simulatorextendedstabilizer +
ZeroZeroFirst02simulatorextendedstabilizer) / 8192},
{(π/2) * 0.4, (OneZeroFirst04simulatorextendedstabilizer +
ZeroZeroFirst04simulatorextendedstabilizer) / 8192},
{(π/2) * 0.6, (OneZeroFirst06simulatorextendedstabilizer +
ZeroZeroFirst06simulatorextendedstabilizer) / 8192},
{(π/2) * 0.8, (OneZeroFirst08simulatorextendedstabilizer +
ZeroZeroFirst08simulatorextendedstabilizer) / 8192},
{(π/2) * 1.0, (OneZeroFirst10simulatorextendedstabilizer +
ZeroZeroFirst10simulatorextendedstabilizer) / 8192}}
ExpCosSqsimulatorextendedstabilizer = ListPlot[CosSqsimulatorextendedstabilizer]
ExpDecisivenesssimulatorextendedstabilizer =
ListPlot[Decisivenesssimulatorextendedstabilizer]

```

Out[]= 8180

Out[]= 12

Out[]= 0

Out[]= 0

Out[]= 7978

Out[]= 3

Out[]= 2

Out[]= 209

Out[]= 7423

Out[]= 6

Out[]= 13

Out[]= 750

Out[]= 6477

Out[]= 11

Out[]= 34

Out[]= 1670

Out[]= 5337

Out[]= 2

Out[]= 63

Out[]= 2790

Out[]= 4100

Out[]= 6

Out[]= 68

Out[]= 4018

Out[]= 2690

Out[]= 1

Out[]= 91

Out[]= 5410

Out[]= 1645

Out[]= 0

Out[]= 145

Out[]= 6402

Out[]= 812

Out[]= 0

Out[]= 134

Out[]= 7246

Out[]= 207

Out[]= 0

Out[]= 147

Out[]= 7838

Out[]= 0

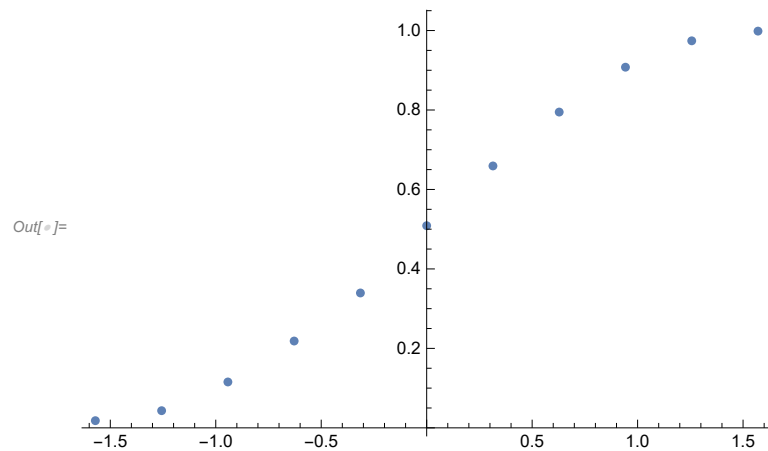
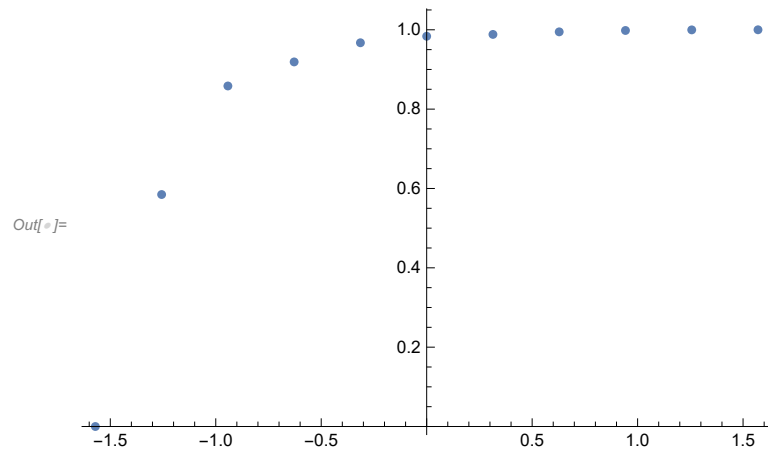
Out[]= 0

Out[]= 148

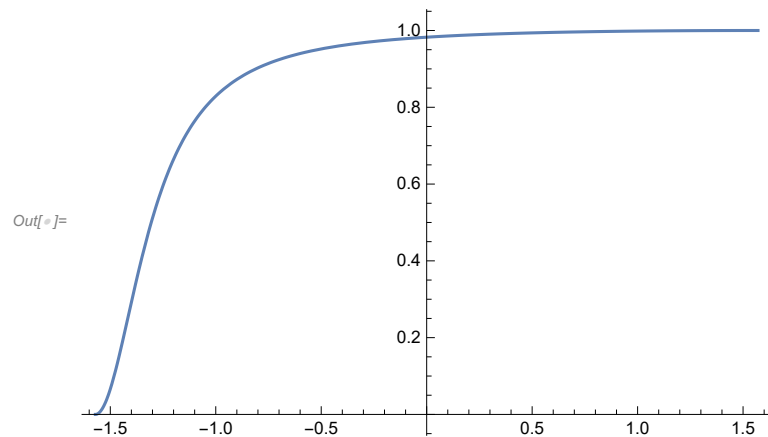
Out[]= 8044

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, 0 \right\}, \left\{ -1.25664, \frac{69}{118} \right\}, \left\{ -0.942478, \frac{406}{473} \right\}, \left\{ -0.628319, \frac{329}{358} \right\}, \left\{ -0.314159, \frac{2690}{2781} \right\}, \right.$
 $\left. \left\{ 0., \frac{1025}{1042} \right\}, \left\{ 0.314159, \frac{593}{600} \right\}, \left\{ 0.628319, \frac{381}{383} \right\}, \left\{ 0.942478, \frac{571}{572} \right\}, \left\{ 1.25664, \frac{3989}{3990} \right\}, \left\{ \frac{\pi}{2}, 1 \right\} \right\}$

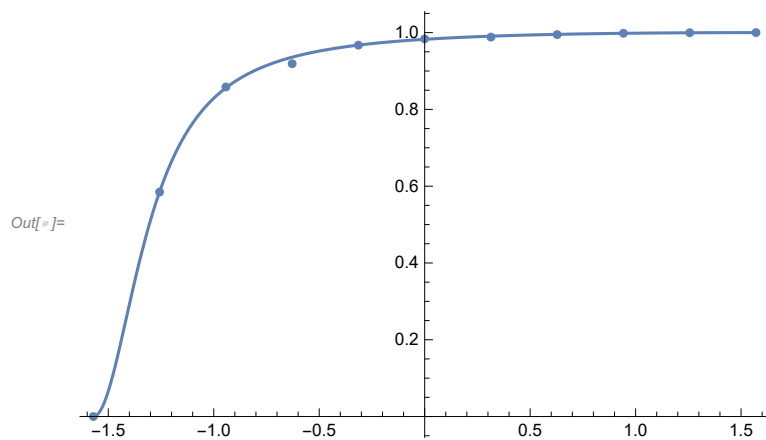
Out[]:= $\left\{ \left\{ -\frac{\pi}{2}, \frac{37}{2048} \right\}, \left\{ -1.25664, \frac{177}{4096} \right\}, \left\{ -0.942478, \frac{473}{4096} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{895}{4096} \right\}, \left\{ -0.314159, \frac{2781}{8192} \right\}, \left\{ 0., \frac{521}{1024} \right\}, \left\{ 0.314159, \frac{675}{1024} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6511}{8192} \right\}, \left\{ 0.942478, \frac{1859}{2048} \right\}, \left\{ 1.25664, \frac{1995}{2048} \right\}, \left\{ 1.5708, \frac{2045}{2048} \right\} \right\}$



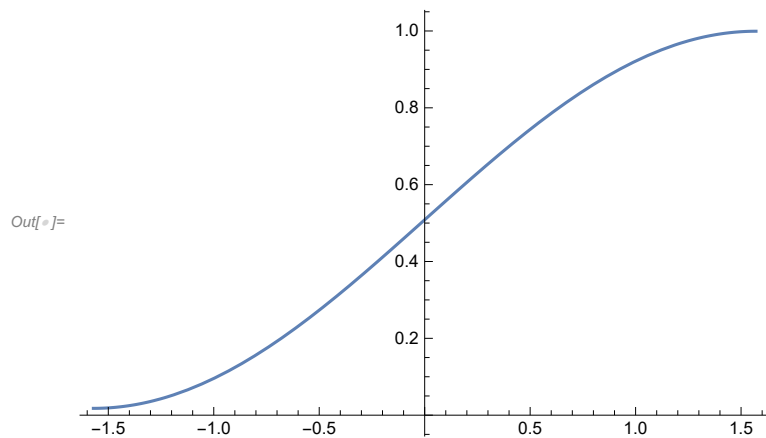
In[]:= **cosTH = Plot**[**cos13F**[$\pi/2 - 0.7, \pi/2, x$], { $x, -\pi/2, \pi/2$ }, **PlotRange** → **All**]



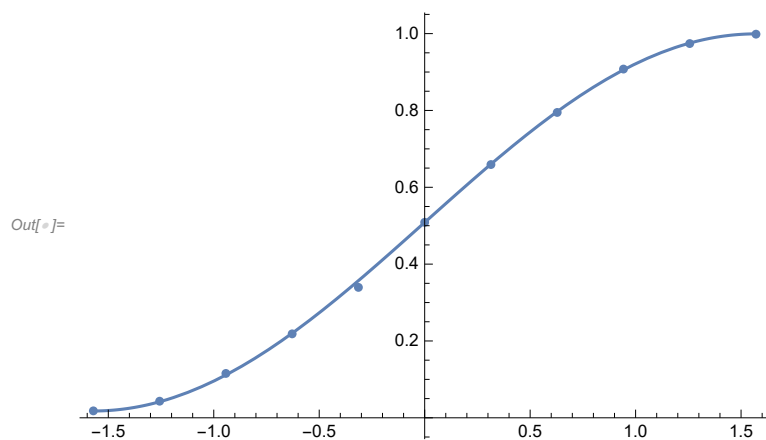
```
In[ ]:= Show[cosTH, ExpCosSqsimulatorextendedstabilizer]
```



```
In[ ]:= decTH = Plot[DecisiveProbability[7.51,  $\pi/2 - 0.7$ ,  $\pi/2$ , x], {x, - $\pi/2$ ,  $\pi/2$ }]
```



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



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

```
ZeroZeroFirst10simulatormps = 8186
```

```
ZeroOneFirst10simulatormps = 6
```

```
OneZeroFirst10simulatormps = 0
```

```
OneOneFirst10simulatormps = 0
```

ZeroZeroFirst08simulatormps = 7984
 ZeroOneFirst08simulatormps = 4
 OneZeroFirst08simulatormps = 3
 OneOneFirst08simulatormps = 201

ZeroZeroFirst06simulatormps = 7401
 ZeroOneFirst06simulatormps = 8
 OneZeroFirst06simulatormps = 17
 OneOneFirst06simulatormps = 766

ZeroZeroFirst04simulatormps = 6509
 ZeroOneFirst04simulatormps = 2
 OneZeroFirst04simulatormps = 29
 OneOneFirst04simulatormps = 1652

ZeroZeroFirst02simulatormps = 5397
 ZeroOneFirst02simulatormps = 11
 OneZeroFirst02simulatormps = 41
 OneOneFirst02simulatormps = 2743

ZeroZeroFirst00simulatormps = 4116
 ZeroOneFirst00simulatormps = 0
 OneZeroFirst00simulatormps = 72
 OneOneFirst00simulatormps = 4004

ZeroZeroSecond02simulatormps = 2800
 ZeroOneSecond02simulatormps = 3
 OneZeroSecond02simulatormps = 91
 OneOneSecond02simulatormps = 5298

ZeroZeroSecond04simulatormps = 1675
 ZeroOneSecond04simulatormps = 1
 OneZeroSecond04simulatormps = 113
 OneOneSecond04simulatormps = 6403

ZeroZeroSecond06simulatormps = 784
 ZeroOneSecond06simulatormps = 0
 OneZeroSecond06simulatormps = 123
 OneOneSecond06simulatormps = 7285

ZeroZeroSecond08simulatormps = 203
 ZeroOneSecond08simulatormps = 0
 OneZeroSecond08simulatormps = 150
 OneOneSecond08simulatormps = 7839

ZeroZeroSecond10simulatormps = 0
 ZeroOneSecond10simulatormps = 0
 OneZeroSecond10simulatormps = 157
 OneOneSecond10simulatormps = 8035

```

CosSqsimulatormps = { {-  $\frac{\pi}{2} * 1$ , ZeroZeroSecond10simulatormps /
  (OneZeroSecond10simulatormps + ZeroZeroSecond10simulatormps) },
  {-  $\frac{\pi}{2} * 0.8$ , ZeroZeroSecond08simulatormps /
  (OneZeroSecond08simulatormps + ZeroZeroSecond08simulatormps) },
  {-  $\frac{\pi}{2} * 0.6$ , ZeroZeroSecond06simulatormps /
  (OneZeroSecond06simulatormps + ZeroZeroSecond06simulatormps) },
  {-  $\frac{\pi}{2} * 0.4$ , ZeroZeroSecond04simulatormps /
  (OneZeroSecond04simulatormps + ZeroZeroSecond04simulatormps) },
  {-  $\frac{\pi}{2} * 0.2$ , ZeroZeroSecond02simulatormps /
  (OneZeroSecond02simulatormps + ZeroZeroSecond02simulatormps) },
  {  $\frac{\pi}{2} * 0.0$ , ZeroZeroFirst00simulatormps / (OneZeroFirst00simulatormps +
    ZeroZeroFirst00simulatormps) }, {  $\frac{\pi}{2} * 0.2$ , ZeroZeroFirst02simulatormps /
    (OneZeroFirst02simulatormps + ZeroZeroFirst02simulatormps) },
  {  $\frac{\pi}{2} * 0.4$ , ZeroZeroFirst04simulatormps / (OneZeroFirst04simulatormps +
    ZeroZeroFirst04simulatormps) }, {  $\frac{\pi}{2} * 0.6$ , ZeroZeroFirst06simulatormps /
    (OneZeroFirst06simulatormps + ZeroZeroFirst06simulatormps) },
  {  $\frac{\pi}{2} * 0.8$ , ZeroZeroFirst08simulatormps / (OneZeroFirst08simulatormps +
    ZeroZeroFirst08simulatormps) }, {  $\frac{\pi}{2} * 1$ , ZeroZeroFirst10simulatormps /
    (OneZeroFirst10simulatormps + ZeroZeroFirst10simulatormps) } }

Decisivenesssimulatormps = { {-  $\frac{\pi}{2} * 1$ ,
  (OneZeroSecond10simulatormps + ZeroZeroSecond10simulatormps) / 8192},
  {-  $\frac{\pi}{2} * 0.8$ , (OneZeroSecond08simulatormps + ZeroZeroSecond08simulatormps) / 8192},
  {-  $\frac{\pi}{2} * 0.6$ , (OneZeroSecond06simulatormps + ZeroZeroSecond06simulatormps) / 8192},
  {-  $\frac{\pi}{2} * 0.4$ , (OneZeroSecond04simulatormps + ZeroZeroSecond04simulatormps) / 8192},
  {-  $\frac{\pi}{2} * 0.2$ , (OneZeroSecond02simulatormps + ZeroZeroSecond02simulatormps) / 8192},
  {-  $\frac{\pi}{2} * 0.0$ , (OneZeroFirst00simulatormps + ZeroZeroFirst00simulatormps) / 8192},
  {  $\frac{\pi}{2} * 0.2$ , (OneZeroFirst02simulatormps + ZeroZeroFirst02simulatormps) / 8192},
  {  $\frac{\pi}{2} * 0.4$ , (OneZeroFirst04simulatormps + ZeroZeroFirst04simulatormps) / 8192},
  {  $\frac{\pi}{2} * 0.6$ , (OneZeroFirst06simulatormps + ZeroZeroFirst06simulatormps) / 8192},
  {  $\frac{\pi}{2} * 0.8$ , (OneZeroFirst08simulatormps + ZeroZeroFirst08simulatormps) / 8192},
  {  $\frac{\pi}{2} * 1$ , (OneZeroFirst10simulatormps + ZeroZeroFirst10simulatormps) / 8192} }

```


$$\left\{ \frac{\pi}{2} * 1.0, (OneZeroFirst10simulatormps + ZeroZeroFirst10simulatormps) / 8192 \right\}$$

ExpCosSqsimulatormps = ListPlot[CosSqsimulatormps]

ExpDecisivenesssimulatormps = ListPlot[Decisivenesssimulatormps]

Out[]= 8186

Out[]= 6

Out[]= 0

Out[]= 0

Out[]= 7984

Out[]= 4

Out[]= 3

Out[]= 201

Out[]= 7401

Out[]= 8

Out[]= 17

Out[]= 766

Out[]= 6509

Out[]= 2

Out[]= 29

Out[]= 1652

Out[]= 5397

Out[]= 11

Out[]= 41

Out[]= 2743

Out[]= 4116

Out[]= 0

Out[]= 72

Out[]= 4004

Out[]= 2800

Out[]= 3

Out[]= 91

Out[]= 5298

$\text{Out}[\#]= 1675$

$\text{Out}[\#]= 1$

$\text{Out}[\#]= 113$

$\text{Out}[\#]= 6403$

$\text{Out}[\#]= 784$

$\text{Out}[\#]= 0$

$\text{Out}[\#]= 123$

$\text{Out}[\#]= 7285$

$\text{Out}[\#]= 203$

$\text{Out}[\#]= 0$

$\text{Out}[\#]= 150$

$\text{Out}[\#]= 7839$

$\text{Out}[\#]= 0$

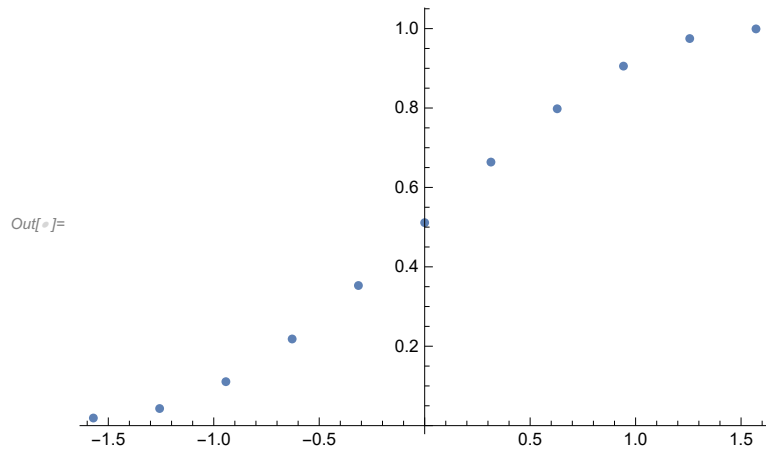
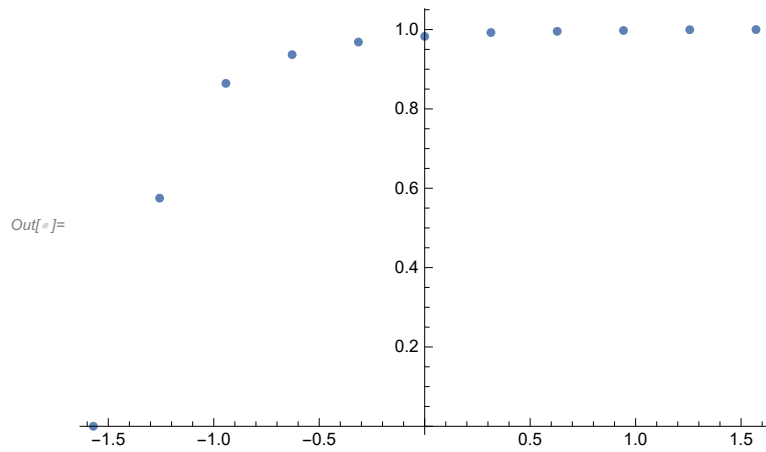
$\text{Out}[\#]= 0$

$\text{Out}[\#]= 157$

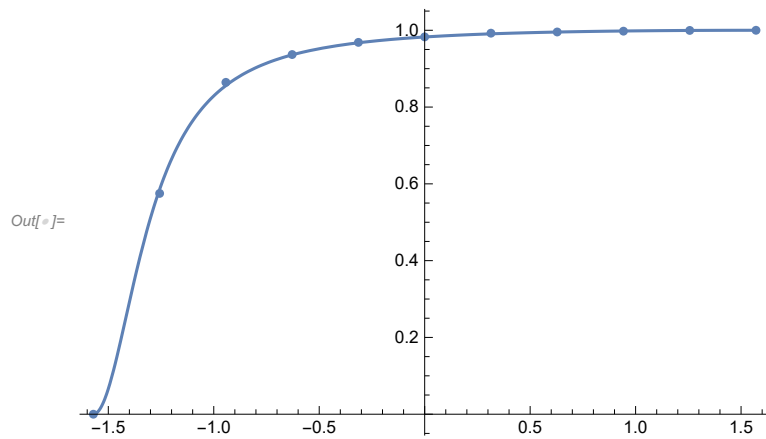
$\text{Out}[\#]= 8035$

$\text{Out}[\#]= \left\{ \left\{ -\frac{\pi}{2}, 0 \right\}, \left\{ -1.25664, \frac{203}{353} \right\}, \left\{ -0.942478, \frac{784}{907} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1675}{1788} \right\}, \left\{ -0.314159, \frac{400}{413} \right\}, \left\{ 0., \frac{343}{349} \right\}, \left\{ 0.314159, \frac{5397}{5438} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6509}{6538} \right\}, \left\{ 0.942478, \frac{7401}{7418} \right\}, \left\{ 1.25664, \frac{7984}{7987} \right\}, \left\{ \frac{\pi}{2}, 1 \right\} \right\}$

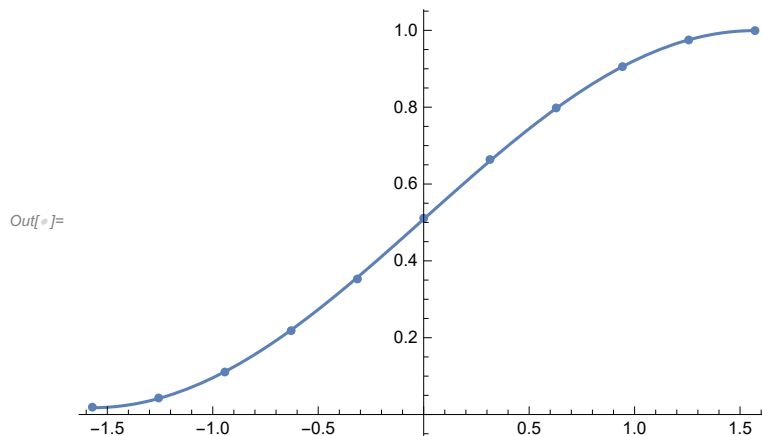
$\text{Out}[\#]= \left\{ \left\{ -\frac{\pi}{2}, \frac{157}{8192} \right\}, \left\{ -1.25664, \frac{353}{8192} \right\}, \left\{ -0.942478, \frac{907}{8192} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{447}{2048} \right\}, \left\{ -0.314159, \frac{2891}{8192} \right\}, \left\{ 0., \frac{1047}{2048} \right\}, \left\{ 0.314159, \frac{2719}{4096} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{3269}{4096} \right\}, \left\{ 0.942478, \frac{3709}{4096} \right\}, \left\{ 1.25664, \frac{7987}{8192} \right\}, \left\{ 1.5708, \frac{4093}{4096} \right\} \right\}$



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



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



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

```
ZeroZeroFirst10simulatorstatevector = 8191
ZeroOneFirst10simulatorstatevector = 1
OneZeroFirst10simulatorstatevector = 0
OneOneFirst10simulatorstatevector = 0
```

```
ZeroZeroFirst08simulatorstatevector = 7975
ZeroOneFirst08simulatorstatevector = 8
OneZeroFirst08simulatorstatevector = 0
OneOneFirst08simulatorstatevector = 209
```

```
ZeroZeroFirst06simulatorstatevector = 7435
ZeroOneFirst06simulatorstatevector = 2
OneZeroFirst06simulatorstatevector = 16
OneOneFirst06simulatorstatevector = 739
```

```
ZeroZeroFirst04simulatorstatevector = 6518
ZeroOneFirst04simulatorstatevector = 5
OneZeroFirst04simulatorstatevector = 18
OneOneFirst04simulatorstatevector = 1651
```

```
ZeroZeroFirst02simulatorstatevector = 5385
ZeroOneFirst02simulatorstatevector = 4
OneZeroFirst02simulatorstatevector = 38
OneOneFirst02simulatorstatevector = 2765
```

```
ZeroZeroFirst00simulatorstatevector = 4128
ZeroOneFirst00simulatorstatevector = 2
OneZeroFirst00simulatorstatevector = 72
OneOneFirst00simulatorstatevector = 3990
```

```
ZeroZeroSecond02simulatorstatevector = 2787
ZeroOneSecond02simulatorstatevector = 1
OneZeroSecond02simulatorstatevector = 96
OneOneSecond02simulatorstatevector = 5308
```

ZeroZeroSecond04simulatorstatevector = 1728
 ZeroOneSecond04simulatorstatevector = 0
 OneZeroSecond04simulatorstatevector = 129
 OneOneSecond04simulatorstatevector = 6335

ZeroZeroSecond06simulatorstatevector = 821
 ZeroOneSecond06simulatorstatevector = 0
 OneZeroSecond06simulatorstatevector = 131
 OneOneSecond06simulatorstatevector = 7240

ZeroZeroSecond08simulatorstatevector = 184
 ZeroOneSecond08simulatorstatevector = 0
 OneZeroSecond08simulatorstatevector = 119
 OneOneSecond08simulatorstatevector = 7889

ZeroZeroSecond10simulatorstatevector = 0
 ZeroOneSecond10simulatorstatevector = 0
 OneZeroSecond10simulatorstatevector = 144
 OneOneSecond10simulatorstatevector = 8048

$$\text{CosSqsimulatorstatevector} = \left\{ \left\{ -\frac{\pi}{2} * 1, \text{ZeroZeroSecond10simulatorstatevector} / \right. \right. \\
\left. \left. (\text{OneZeroSecond10simulatorstatevector} + \text{ZeroZeroSecond10simulatorstatevector}) \right\}, \right. \\
\left\{ -\frac{\pi}{2} * 0.8, \text{ZeroZeroSecond08simulatorstatevector} / \right. \\
\left. (\text{OneZeroSecond08simulatorstatevector} + \text{ZeroZeroSecond08simulatorstatevector}) \right\}, \\
\left\{ -\frac{\pi}{2} * 0.6, \text{ZeroZeroSecond06simulatorstatevector} / \right. \\
\left. (\text{OneZeroSecond06simulatorstatevector} + \text{ZeroZeroSecond06simulatorstatevector}) \right\}, \\
\left\{ -\frac{\pi}{2} * 0.4, \text{ZeroZeroSecond04simulatorstatevector} / \right. \\
\left. (\text{OneZeroSecond04simulatorstatevector} + \text{ZeroZeroSecond04simulatorstatevector}) \right\}, \\
\left\{ -\frac{\pi}{2} * 0.2, \text{ZeroZeroSecond02simulatorstatevector} / \right. \\
\left. (\text{OneZeroSecond02simulatorstatevector} + \text{ZeroZeroSecond02simulatorstatevector}) \right\}, \\
\left\{ \frac{\pi}{2} * 0.0, \text{ZeroZeroFirst00simulatorstatevector} / \right. \\
\left. (\text{OneZeroFirst00simulatorstatevector} + \text{ZeroZeroFirst00simulatorstatevector}) \right\}, \\
\left\{ \frac{\pi}{2} * 0.2, \text{ZeroZeroFirst02simulatorstatevector} / \right. \\
\left. (\text{OneZeroFirst02simulatorstatevector} + \text{ZeroZeroFirst02simulatorstatevector}) \right\}, \\
\left\{ \frac{\pi}{2} * 0.4, \text{ZeroZeroFirst04simulatorstatevector} / \right. \\
\left. (\text{OneZeroFirst04simulatorstatevector} + \text{ZeroZeroFirst04simulatorstatevector}) \right\}, \\
\left\{ \frac{\pi}{2} * 0.6, \text{ZeroZeroFirst06simulatorstatevector} / \right. \\
\left. (\text{OneZeroFirst06simulatorstatevector} + \text{ZeroZeroFirst06simulatorstatevector}) \right\}, \\
\left\{ \frac{\pi}{2} * 0.8, \text{ZeroZeroFirst08simulatorstatevector} / \right. \\
\left. (\text{OneZeroFirst08simulatorstatevector} + \text{ZeroZeroFirst08simulatorstatevector}) \right\},$$

```


$$\left\{ \frac{\pi}{2} * 1, \text{ZeroZeroFirst10simulatorstatevector} / \right.$$


$$\left. (\text{OneZeroFirst10simulatorstatevector} + \text{ZeroZeroFirst10simulatorstatevector}) \right\}$$

Decisivenesssimulatorstatevector =  $\left\{ \left\{ -\frac{\pi}{2} * 1, \right.$ 

$$\left. (\text{OneZeroSecond10simulatorstatevector} + \text{ZeroZeroSecond10simulatorstatevector}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.8, (\text{OneZeroSecond08simulatorstatevector} + \text{ZeroZeroSecond08simulatorstatevector}) / \right.$$


$$8192 \right\}, \left\{ -\frac{\pi}{2} * 0.6,$$


$$(\text{OneZeroSecond06simulatorstatevector} + \text{ZeroZeroSecond06simulatorstatevector}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.4, (\text{OneZeroSecond04simulatorstatevector} + \text{ZeroZeroSecond04simulatorstatevector}) / \right.$$


$$8192 \right\}, \left\{ -\frac{\pi}{2} * 0.2,$$


$$(\text{OneZeroSecond02simulatorstatevector} + \text{ZeroZeroSecond02simulatorstatevector}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.0, (\text{OneZeroFirst00simulatorstatevector} + \text{ZeroZeroFirst00simulatorstatevector}) / \right.$$


$$8192 \right\}, \left\{ \frac{\pi}{2} * 0.2,$$


$$(\text{OneZeroFirst02simulatorstatevector} + \text{ZeroZeroFirst02simulatorstatevector}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 0.4, (\text{OneZeroFirst04simulatorstatevector} + \text{ZeroZeroFirst04simulatorstatevector}) / \right.$$


$$8192 \right\}, \left\{ \frac{\pi}{2} * 0.6,$$


$$(\text{OneZeroFirst06simulatorstatevector} + \text{ZeroZeroFirst06simulatorstatevector}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 0.8, (\text{OneZeroFirst08simulatorstatevector} + \text{ZeroZeroFirst08simulatorstatevector}) / \right.$$


$$8192 \right\}, \left\{ \frac{\pi}{2} * 1.0,$$


$$(\text{OneZeroFirst10simulatorstatevector} + \text{ZeroZeroFirst10simulatorstatevector}) / 8192 \right\}$$

ExpCosSqsimulatorstatevector = ListPlot[CosSqsimulatorstatevector]
ExpDecisivenesssimulatorstatevector = ListPlot[Decisivenesssimulatorstatevector]

```

Out[]= 8191

Out[]= 1

Out[]= 0

Out[]= 0

Out[]= 7975

Out[]= 8

Out[]= 0

Out[]= 209

Out[]= 7435

Out[]= 2

Out[]= 16

Out[]= 739

Out[]= 6518

Out[]= 5

Out[]= 18

Out[]= 1651

Out[]= 5385

Out[]= 4

Out[]= 38

Out[]= 2765

Out[]= 4128

Out[]= 2

Out[]= 72

Out[]= 3990

Out[]= 2787

Out[]= 1

Out[]= 96

Out[]= 5308

Out[]= 1728

Out[]= 0

Out[]= 129

Out[]= 6335

Out[]= 821

Out[]= 0

Out[]= 131

Out[]= 7240

Out[]= 184

Out[]= 0

Out[]= 119

Out[]= 7889

Out[]= 0

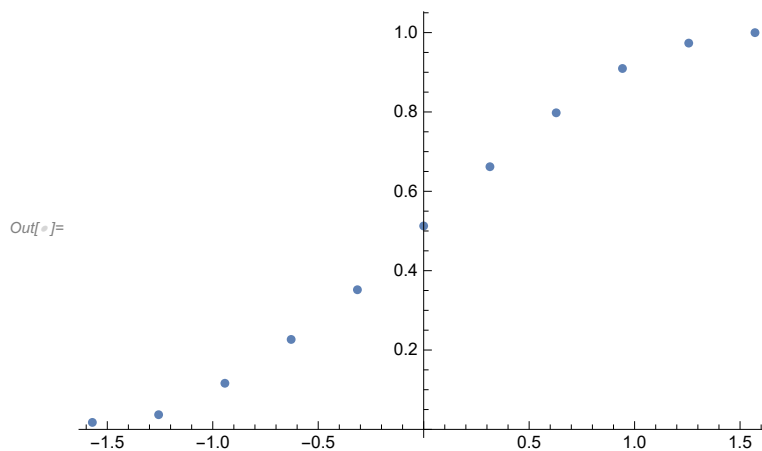
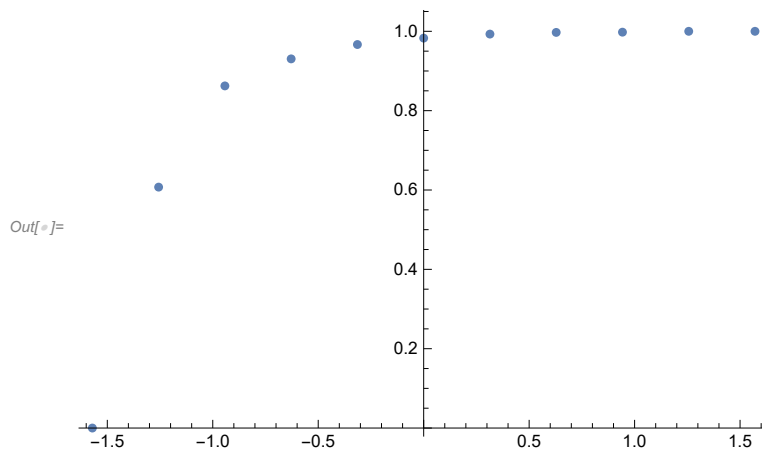
Out[]= 0

Out[]= 144

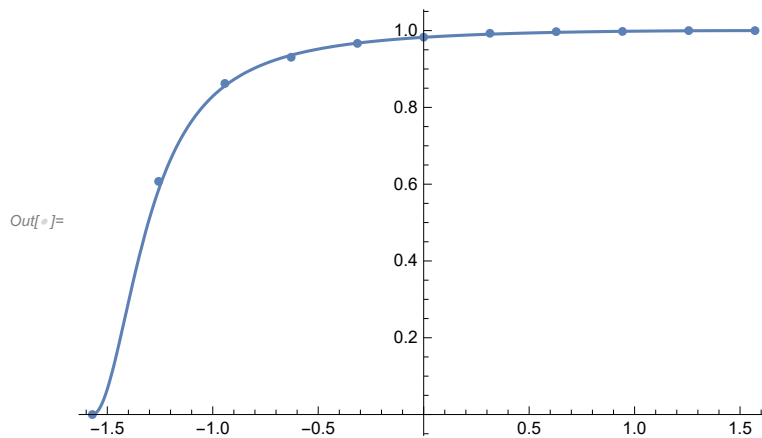
Out[]= 8048

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, 0 \right\}, \left\{ -1.25664, \frac{184}{303} \right\}, \left\{ -0.942478, \frac{821}{952} \right\}, \left\{ -0.628319, \frac{576}{619} \right\}, \left\{ -0.314159, \frac{929}{961} \right\}, \right.$
 $\left. \left\{ 0., \frac{172}{175} \right\}, \left\{ 0.314159, \frac{5385}{5423} \right\}, \left\{ 0.628319, \frac{3259}{3268} \right\}, \left\{ 0.942478, \frac{7435}{7451} \right\}, \left\{ 1.25664, 1 \right\}, \left\{ \frac{\pi}{2}, 1 \right\} \right\}$

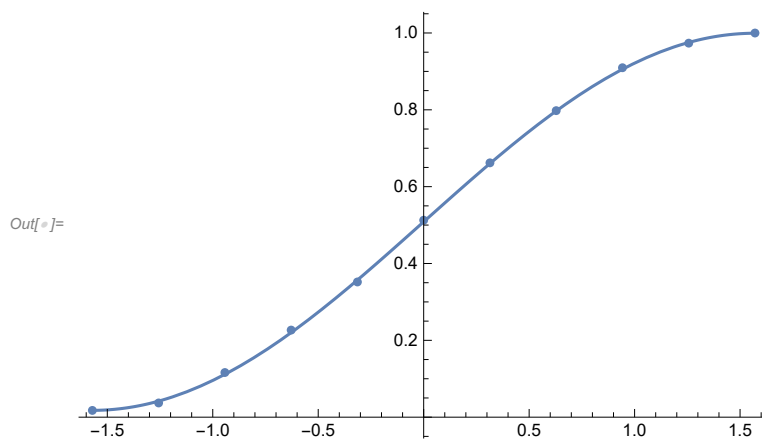
Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{9}{512} \right\}, \left\{ -1.25664, \frac{303}{8192} \right\}, \left\{ -0.942478, \frac{119}{1024} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1857}{8192} \right\}, \left\{ -0.314159, \frac{2883}{8192} \right\}, \left\{ 0., \frac{525}{1024} \right\}, \left\{ 0.314159, \frac{5423}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{817}{1024} \right\}, \left\{ 0.942478, \frac{7451}{8192} \right\}, \left\{ 1.25664, \frac{7975}{8192} \right\}, \left\{ 1.5708, \frac{8191}{8192} \right\} \right\}$



In[]:= Show[cosTH, ExpCosSqsimulatorstatevector]



In[]:= Show[decTH, ExpDecisivenesssimulatorstatevector]



In[]:= (*ibm_nairobi*)

ZeroZeroFirst10ibmnairobi = 7607

ZeroOneFirst10ibmnairobi = 181

OneZeroFirst10ibmnairobi = 112

OneOneFirst10ibmnairobi = 292

ZeroZeroFirst08ibmnairobi = 7074

ZeroOneFirst08ibmnairobi = 257

OneZeroFirst08ibmnairobi = 152

OneOneFirst08ibmnairobi = 709

ZeroZeroFirst06ibmnairobi = 6189

ZeroOneFirst06ibmnairobi = 411

OneZeroFirst06ibmnairobi = 159

OneOneFirst06ibmnairobi = 1433

ZeroZeroFirst04ibmnairobi = 5252

ZeroOneFirst04ibmnairobi = 432

OneZeroFirst04ibmnairobi = 202

OneOneFirst04ibmnairobi = 2306

ZeroZeroFirst02ibmnairobi = 4039
 ZeroOneFirst02ibmnairobi = 651
 OneZeroFirst02ibmnairobi = 228
 OneOneFirst02ibmnairobi = 3274

ZeroZeroFirst00ibmnairobi = 2782
 ZeroOneFirst00ibmnairobi = 353
 OneZeroFirst00ibmnairobi = 263
 OneOneFirst00ibmnairobi = 4794

ZeroZeroSecond02ibmnairobi = 1769
 ZeroOneSecond02ibmnairobi = 594
 OneZeroSecond02ibmnairobi = 296
 OneOneSecond02ibmnairobi = 5533

ZeroZeroSecond04ibmnairobi = 912
 ZeroOneSecond04ibmnairobi = 564
 OneZeroSecond04ibmnairobi = 416
 OneOneSecond04ibmnairobi = 6300

ZeroZeroSecond06ibmnairobi = 319
 ZeroOneSecond06ibmnairobi = 529
 OneZeroSecond06ibmnairobi = 397
 OneOneSecond06ibmnairobi = 6947

ZeroZeroSecond08ibmnairobi = 171
 ZeroOneSecond08ibmnairobi = 501
 OneZeroSecond08ibmnairobi = 407
 OneOneSecond08ibmnairobi = 7113

ZeroZeroSecond10ibmnairobi = 275
 ZeroOneSecond10ibmnairobi = 606
 OneZeroSecond10ibmnairobi = 375
 OneOneSecond10ibmnairobi = 6936

CosSqibmnairobi = { { - ($\pi/2$) * 1,
 ZeroZeroSecond10ibmnairobi / (OneZeroSecond10ibmnairobi + ZeroZeroSecond10ibmnairobi) },
 { - ($\pi/2$) * 0.8, ZeroZeroSecond08ibmnairobi /
 (OneZeroSecond08ibmnairobi + ZeroZeroSecond08ibmnairobi) }, { - ($\pi/2$) * 0.6,
 ZeroZeroSecond06ibmnairobi / (OneZeroSecond06ibmnairobi + ZeroZeroSecond06ibmnairobi) },
 { - ($\pi/2$) * 0.4, ZeroZeroSecond04ibmnairobi /
 (OneZeroSecond04ibmnairobi + ZeroZeroSecond04ibmnairobi) }, { - ($\pi/2$) * 0.2,
 ZeroZeroSecond02ibmnairobi / (OneZeroSecond02ibmnairobi + ZeroZeroSecond02ibmnairobi) },
 { ($\pi/2$) * 0.0, ZeroZeroFirst00ibmnairobi /
 (OneZeroFirst00ibmnairobi + ZeroZeroFirst00ibmnairobi) }, { ($\pi/2$) * 0.2,
 ZeroZeroFirst02ibmnairobi / (OneZeroFirst02ibmnairobi + ZeroZeroFirst02ibmnairobi) },
 { ($\pi/2$) * 0.4, ZeroZeroFirst04ibmnairobi /
 (OneZeroFirst04ibmnairobi + ZeroZeroFirst04ibmnairobi) }, { ($\pi/2$) * 0.6,
 ZeroZeroFirst06ibmnairobi / (OneZeroFirst06ibmnairobi + ZeroZeroFirst06ibmnairobi) },
 { ($\pi/2$) * 0.8, ZeroZeroFirst08ibmnairobi /

```

      (OneZeroFirst08ibmnairobi + ZeroZeroFirst08ibmnairobi)}, {(π/2) * 1,
      ZeroZeroFirst10ibmnairobi / (OneZeroFirst10ibmnairobi + ZeroZeroFirst10ibmnairobi)}}
Decisivenessibmnairobi = {{-(π/2) * 1,
      (OneZeroSecond10ibmnairobi + ZeroZeroSecond10ibmnairobi) / 8192},
      {-(π/2) * 0.8, (OneZeroSecond08ibmnairobi + ZeroZeroSecond08ibmnairobi) / 8192},
      {-(π/2) * 0.6, (OneZeroSecond06ibmnairobi + ZeroZeroSecond06ibmnairobi) / 8192},
      {-(π/2) * 0.4, (OneZeroSecond04ibmnairobi + ZeroZeroSecond04ibmnairobi) / 8192},
      {-(π/2) * 0.2, (OneZeroSecond02ibmnairobi + ZeroZeroSecond02ibmnairobi) / 8192},
      {-(π/2) * 0.0, (OneZeroFirst00ibmnairobi + ZeroZeroFirst00ibmnairobi) / 8192},
      {(π/2) * 0.2, (OneZeroFirst02ibmnairobi + ZeroZeroFirst02ibmnairobi) / 8192},
      {(π/2) * 0.4, (OneZeroFirst04ibmnairobi + ZeroZeroFirst04ibmnairobi) / 8192},
      {(π/2) * 0.6, (OneZeroFirst06ibmnairobi + ZeroZeroFirst06ibmnairobi) / 8192},
      {(π/2) * 0.8, (OneZeroFirst08ibmnairobi + ZeroZeroFirst08ibmnairobi) / 8192},
      {(π/2) * 1.0, (OneZeroFirst10ibmnairobi + ZeroZeroFirst10ibmnairobi) / 8192}}
ExpCosSqibmnairobi = ListPlot[CosSqibmnairobi]
ExpDecisivenessibmnairobi = ListPlot[Decisivenessibmnairobi]

```

Out[]= 7607

Out[]= 181

Out[]= 112

Out[]= 292

Out[]= 7074

Out[]= 257

Out[]= 152

Out[]= 709

Out[]= 6189

Out[]= 411

Out[]= 159

Out[]= 1433

Out[]= 5252

Out[]= 432

Out[]= 202

Out[]= 2306

Out[]= 4039

Out[]= 651

Out[]= 228

Out[]= 3274

Out[]= 2782

Out[]= 353

Out[]= 263

Out[]= 4794

Out[]= 1769

Out[]= 594

Out[]= 296

Out[]= 5533

Out[]= 912

Out[]= 564

Out[]= 416

Out[]= 6300

Out[]= 319

Out[]= 529

Out[]= 397

Out[]= 6947

Out[]= 171

Out[]= 501

Out[]= 407

Out[]= 7113

Out[]= 275

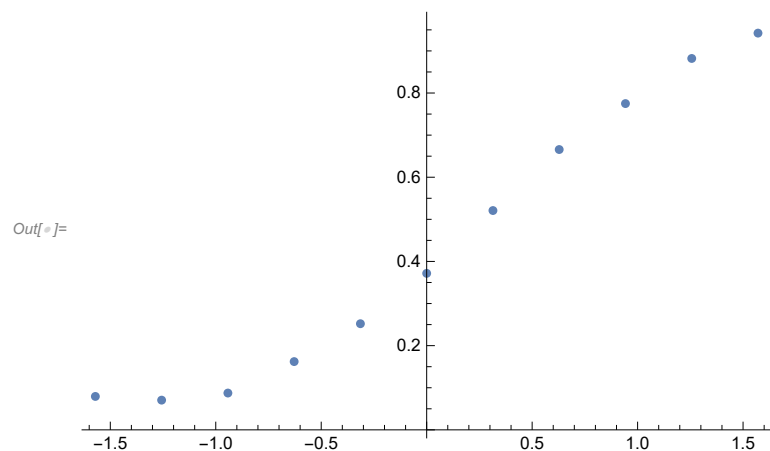
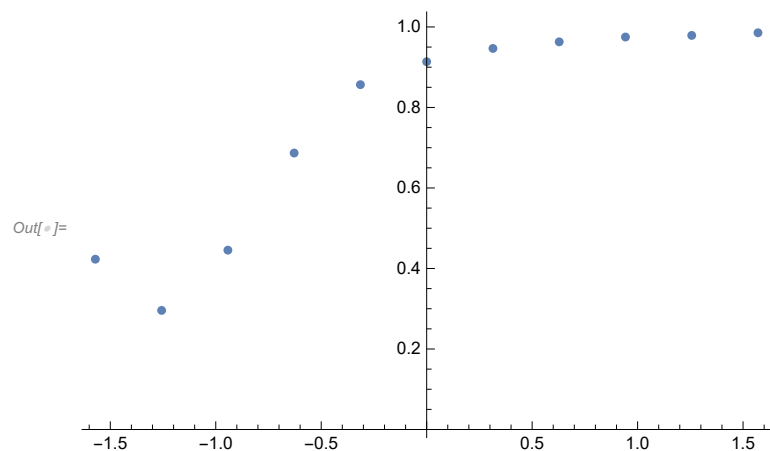
Out[]= 606

Out[]= 375

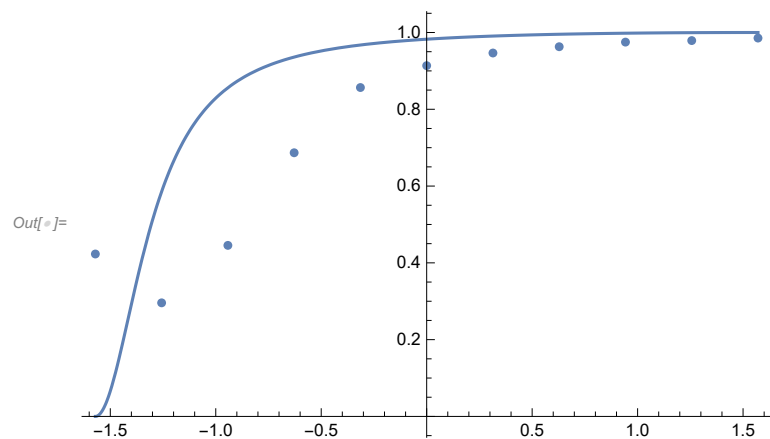
Out[]= 6936

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{11}{26} \right\}, \left\{ -1.25664, \frac{171}{578} \right\}, \left\{ -0.942478, \frac{319}{716} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{57}{83} \right\}, \left\{ -0.314159, \frac{1769}{2065} \right\}, \left\{ 0., \frac{2782}{3045} \right\}, \left\{ 0.314159, \frac{4039}{4267} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{26}{27} \right\}, \left\{ 0.942478, \frac{2063}{2116} \right\}, \left\{ 1.25664, \frac{3537}{3613} \right\}, \left\{ \frac{\pi}{2}, \frac{7607}{7719} \right\} \right\}$

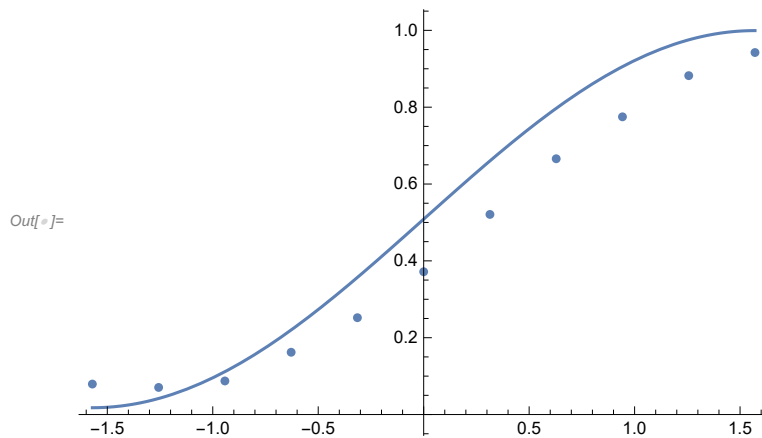
Out[]:= $\left\{ \left\{ -\frac{\pi}{2}, \frac{325}{4096} \right\}, \left\{ -1.25664, \frac{289}{4096} \right\}, \left\{ -0.942478, \frac{179}{2048} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{83}{512} \right\}, \left\{ -0.314159, \frac{2065}{8192} \right\}, \left\{ 0., \frac{3045}{8192} \right\}, \left\{ 0.314159, \frac{4267}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{2727}{4096} \right\}, \left\{ 0.942478, \frac{1587}{2048} \right\}, \left\{ 1.25664, \frac{3613}{4096} \right\}, \left\{ 1.5708, \frac{7719}{8192} \right\} \right\}$



In[]:= Show[cosh, ExpCosSqbmnairobi]



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



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

```
ZeroZeroFirst10ibmoslo = 7191
ZeroOneFirst10ibmoslo = 677
OneZeroFirst10ibmoslo = 166
OneOneFirst10ibmoslo = 158
```

```
ZeroZeroFirst08ibmoslo = 6951
ZeroOneFirst08ibmoslo = 716
OneZeroFirst08ibmoslo = 174
OneOneFirst08ibmoslo = 351
```

```
ZeroZeroFirst06ibmoslo = 6510
ZeroOneFirst06ibmoslo = 699
OneZeroFirst06ibmoslo = 161
OneOneFirst06ibmoslo = 822
```

```
ZeroZeroFirst04ibmoslo = 5670
ZeroOneFirst04ibmoslo = 585
OneZeroFirst04ibmoslo = 178
OneOneFirst04ibmoslo = 1759
```

```
ZeroZeroFirst02ibmoslo = 4671
ZeroOneFirst02ibmoslo = 536
OneZeroFirst02ibmoslo = 220
OneOneFirst02ibmoslo = 2765
```

```
ZeroZeroFirst00ibmoslo = 3648
ZeroOneFirst00ibmoslo = 447
OneZeroFirst00ibmoslo = 247
OneOneFirst00ibmoslo = 3850
```

```
ZeroZeroSecond02ibmoslo = 2624
ZeroOneSecond02ibmoslo = 324
OneZeroSecond02ibmoslo = 233
OneOneSecond02ibmoslo = 5011
```

ZeroZeroSecond04ibmoslo = 1579
 ZeroOneSecond04ibmoslo = 230
 OneZeroSecond04ibmoslo = 307
 OneOneSecond04ibmoslo = 6076

ZeroZeroSecond06ibmoslo = 837
 ZeroOneSecond06ibmoslo = 166
 OneZeroSecond06ibmoslo = 290
 OneOneSecond06ibmoslo = 6899

ZeroZeroSecond08ibmoslo = 331
 ZeroOneSecond08ibmoslo = 147
 OneZeroSecond08ibmoslo = 300
 OneOneSecond08ibmoslo = 7414

ZeroZeroSecond10ibmoslo = 147
 ZeroOneSecond10ibmoslo = 179
 OneZeroSecond10ibmoslo = 316
 OneOneSecond10ibmoslo = 7550

CosSqibmoslo =

$$\begin{aligned}
 & \left\{ \left\{ -\frac{\pi}{2} * 1, \text{ZeroZeroSecond10ibmoslo} / (\text{OneZeroSecond10ibmoslo} + \text{ZeroZeroSecond10ibmoslo}) \right\}, \right. \\
 & \left\{ -\frac{\pi}{2} * 0.8, \text{ZeroZeroSecond08ibmoslo} / (\text{OneZeroSecond08ibmoslo} + \text{ZeroZeroSecond08ibmoslo}) \right\}, \\
 & \left\{ -\frac{\pi}{2} * 0.6, \text{ZeroZeroSecond06ibmoslo} / (\text{OneZeroSecond06ibmoslo} + \text{ZeroZeroSecond06ibmoslo}) \right\}, \\
 & \left\{ -\frac{\pi}{2} * 0.4, \text{ZeroZeroSecond04ibmoslo} / (\text{OneZeroSecond04ibmoslo} + \text{ZeroZeroSecond04ibmoslo}) \right\}, \\
 & \left\{ -\frac{\pi}{2} * 0.2, \text{ZeroZeroSecond02ibmoslo} / (\text{OneZeroSecond02ibmoslo} + \text{ZeroZeroSecond02ibmoslo}) \right\}, \\
 & \left\{ \frac{\pi}{2} * 0.0, \text{ZeroZeroFirst00ibmoslo} / (\text{OneZeroFirst00ibmoslo} + \text{ZeroZeroFirst00ibmoslo}) \right\}, \\
 & \left\{ \frac{\pi}{2} * 0.2, \text{ZeroZeroFirst02ibmoslo} / (\text{OneZeroFirst02ibmoslo} + \text{ZeroZeroFirst02ibmoslo}) \right\}, \\
 & \left\{ \frac{\pi}{2} * 0.4, \text{ZeroZeroFirst04ibmoslo} / (\text{OneZeroFirst04ibmoslo} + \text{ZeroZeroFirst04ibmoslo}) \right\}, \\
 & \left\{ \frac{\pi}{2} * 0.6, \text{ZeroZeroFirst06ibmoslo} / (\text{OneZeroFirst06ibmoslo} + \text{ZeroZeroFirst06ibmoslo}) \right\}, \\
 & \left\{ \frac{\pi}{2} * 0.8, \text{ZeroZeroFirst08ibmoslo} / (\text{OneZeroFirst08ibmoslo} + \text{ZeroZeroFirst08ibmoslo}) \right\}, \\
 & \left. \left\{ \frac{\pi}{2} * 1, \text{ZeroZeroFirst10ibmoslo} / (\text{OneZeroFirst10ibmoslo} + \text{ZeroZeroFirst10ibmoslo}) \right\} \right\}
 \end{aligned}$$

$$\begin{aligned}
 \text{Decisivenessibmoslo} = & \left\{ \left\{ -\frac{\pi}{2} * 1, (\text{OneZeroSecond10ibmoslo} + \text{ZeroZeroSecond10ibmoslo}) / 8192 \right\}, \right. \\
 & \left\{ -\frac{\pi}{2} * 0.8, (\text{OneZeroSecond08ibmoslo} + \text{ZeroZeroSecond08ibmoslo}) / 8192 \right\}, \\
 & \left\{ -\frac{\pi}{2} * 0.6, (\text{OneZeroSecond06ibmoslo} + \text{ZeroZeroSecond06ibmoslo}) / 8192 \right\}, \\
 & \left. \left\{ -\frac{\pi}{2} * 0.4, (\text{OneZeroSecond04ibmoslo} + \text{ZeroZeroSecond04ibmoslo}) / 8192 \right\}, \right.
 \end{aligned}$$

$$\left\{-\frac{\pi}{2} * 0.2, (OneZeroSecond02ibmoslo + ZeroZeroSecond02ibmoslo) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.0, (OneZeroFirst00ibmoslo + ZeroZeroFirst00ibmoslo) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.2, (OneZeroFirst02ibmoslo + ZeroZeroFirst02ibmoslo) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.4, (OneZeroFirst04ibmoslo + ZeroZeroFirst04ibmoslo) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.6, (OneZeroFirst06ibmoslo + ZeroZeroFirst06ibmoslo) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.8, (OneZeroFirst08ibmoslo + ZeroZeroFirst08ibmoslo) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 1.0, (OneZeroFirst10ibmoslo + ZeroZeroFirst10ibmoslo) / 8192\right\}$$

ExpCosSqibmoslo = ListPlot[CosSqibmoslo]

ExpDecisivenessibmoslo = ListPlot[Decisivenessibmoslo]

Out[]= 7191

Out[]= 677

Out[]= 166

Out[]= 158

Out[]= 6951

Out[]= 716

Out[]= 174

Out[]= 351

Out[]= 6510

Out[]= 699

Out[]= 161

Out[]= 822

Out[]= 5670

Out[]= 585

Out[]= 178

Out[]= 1759

Out[]= 4671

Out[]= 536

Out[]= 220

Out[]= 2765

Out[]= 3648

Out[]= 447

Out[]= 247

Out[]= 3850

Out[]= 2624

Out[]= 324

Out[]= 233

Out[]= 5011

Out[]= 1579

Out[]= 230

Out[]= 307

Out[]= 6076

Out[]= 837

Out[]= 166

Out[]= 290

Out[]= 6899

Out[]= 331

Out[]= 147

Out[]= 300

Out[]= 7414

Out[]= 147

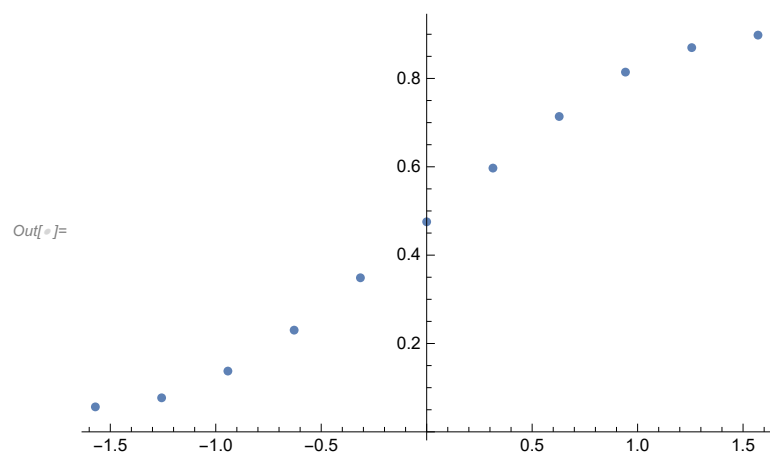
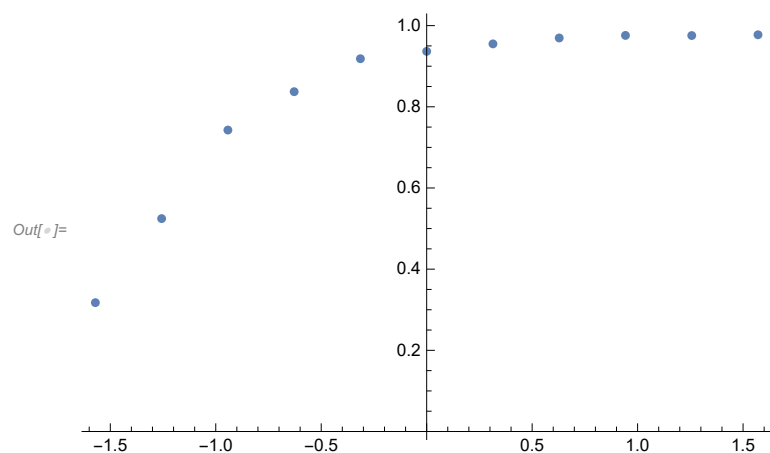
Out[]= 179

Out[]= 316

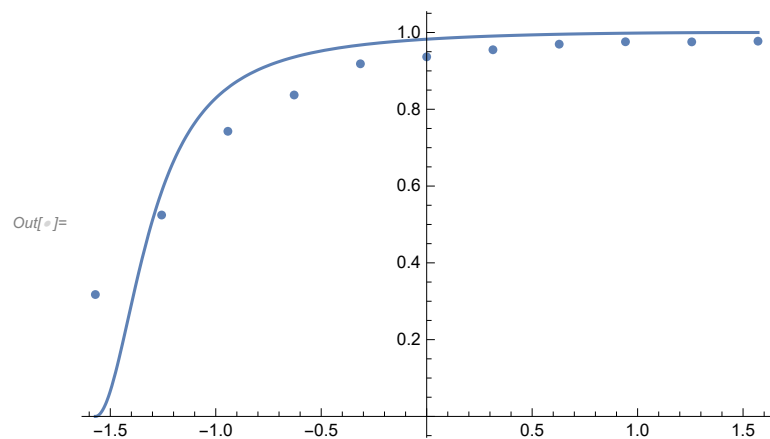
Out[]= 7550

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{147}{463} \right\}, \left\{ -1.25664, \frac{331}{631} \right\}, \left\{ -0.942478, \frac{837}{1127} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1579}{1886} \right\}, \left\{ -0.314159, \frac{2624}{2857} \right\}, \left\{ 0., \frac{192}{205} \right\}, \left\{ 0.314159, \frac{4671}{4891} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{2835}{2924} \right\}, \left\{ 0.942478, \frac{930}{953} \right\}, \left\{ 1.25664, \frac{2317}{2375} \right\}, \left\{ \frac{\pi}{2}, \frac{7191}{7357} \right\} \right\}$

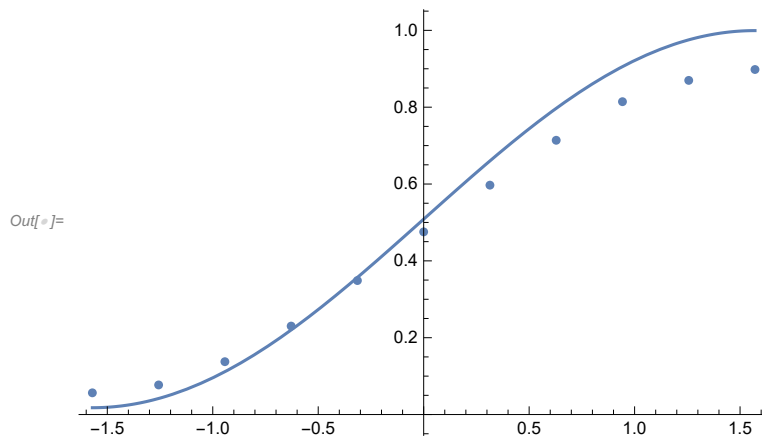
Out[]:= $\left\{ \left\{ -\frac{\pi}{2}, \frac{463}{8192} \right\}, \left\{ -1.25664, \frac{631}{8192} \right\}, \left\{ -0.942478, \frac{1127}{8192} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{943}{4096} \right\}, \left\{ -0.314159, \frac{2857}{8192} \right\}, \left\{ 0., \frac{3895}{8192} \right\}, \left\{ 0.314159, \frac{4891}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{731}{1024} \right\}, \left\{ 0.942478, \frac{6671}{8192} \right\}, \left\{ 1.25664, \frac{7125}{8192} \right\}, \left\{ 1.5708, \frac{7357}{8192} \right\} \right\}$



In[]:= Show[cosTH, ExpCosSqibmoslo]



In[]:= Show[decTH, ExpDecisivenessibmoslo]



In[]:= (*ibmq_manila*)

ZeroZeroFirst10ibmqmanila = 7602

ZeroOneFirst10ibmqmanila = 169

OneZeroFirst10ibmqmanila = 229

OneOneFirst10ibmqmanila = 192

ZeroZeroFirst08ibmqmanila = 7404

ZeroOneFirst08ibmqmanila = 183

OneZeroFirst08ibmqmanila = 222

OneOneFirst08ibmqmanila = 383

ZeroZeroFirst06ibmqmanila = 6827

ZeroOneFirst06ibmqmanila = 195

OneZeroFirst06ibmqmanila = 224

OneOneFirst06ibmqmanila = 946

ZeroZeroFirst04ibmqmanila = 5879

ZeroOneFirst04ibmqmanila = 208

OneZeroFirst04ibmqmanila = 269

OneOneFirst04ibmqmanila = 1836

ZeroZeroFirst02ibmqmanila = 4732

ZeroOneFirst02ibmqmanila = 293

OneZeroFirst02ibmqmanila = 399

OneOneFirst02ibmqmanila = 2768

ZeroZeroFirst00ibmqmanila = 3625

ZeroOneFirst00ibmqmanila = 246

OneZeroFirst00ibmqmanila = 449

OneOneFirst00ibmqmanila = 3872

ZeroZeroSecond02ibmqmanila = 2397

ZeroOneSecond02ibmqmanila = 331

OneZeroSecond02ibmqmanila = 305

OneOneSecond02ibmqmanila = 5159

ZeroZeroSecond04ibmqmanila = 1412
 ZeroOneSecond04ibmqmanila = 355
 OneZeroSecond04ibmqmanila = 367
 OneOneSecond04ibmqmanila = 6058

ZeroZeroSecond06ibmqmanila = 732
 ZeroOneSecond06ibmqmanila = 321
 OneZeroSecond06ibmqmanila = 401
 OneOneSecond06ibmqmanila = 6738

ZeroZeroSecond08ibmqmanila = 212
 ZeroOneSecond08ibmqmanila = 390
 OneZeroSecond08ibmqmanila = 429
 OneOneSecond08ibmqmanila = 7161

ZeroZeroSecond10ibmqmanila = 115
 ZeroOneSecond10ibmqmanila = 375
 OneZeroSecond10ibmqmanila = 416
 OneOneSecond10ibmqmanila = 7286

CosSqibmqmanila = $\left\{ \left\{ -\frac{\pi}{2} * 1, \right. \right.$
 $\left. \frac{\text{ZeroZeroSecond10ibmqmanila}}{\left(\text{OneZeroSecond10ibmqmanila} + \text{ZeroZeroSecond10ibmqmanila} \right)}, \right.$
 $\left\{ -\frac{\pi}{2} * 0.8, \frac{\text{ZeroZeroSecond08ibmqmanila}}{\left(\text{OneZeroSecond08ibmqmanila} + \text{ZeroZeroSecond08ibmqmanila} \right)}, \right.$
 $\left\{ -\frac{\pi}{2} * 0.6, \right.$
 $\left. \frac{\text{ZeroZeroSecond06ibmqmanila}}{\left(\text{OneZeroSecond06ibmqmanila} + \text{ZeroZeroSecond06ibmqmanila} \right)}, \right.$
 $\left\{ -\frac{\pi}{2} * 0.4, \frac{\text{ZeroZeroSecond04ibmqmanila}}{\left(\text{OneZeroSecond04ibmqmanila} + \text{ZeroZeroSecond04ibmqmanila} \right)}, \right.$
 $\left\{ -\frac{\pi}{2} * 0.2, \right.$
 $\left. \frac{\text{ZeroZeroSecond02ibmqmanila}}{\left(\text{OneZeroSecond02ibmqmanila} + \text{ZeroZeroSecond02ibmqmanila} \right)}, \right.$
 $\left\{ \frac{\pi}{2} * 0.0, \frac{\text{ZeroZeroFirst00ibmqmanila}}{\left(\text{OneZeroFirst00ibmqmanila} + \text{ZeroZeroFirst00ibmqmanila} \right)}, \right.$
 $\left\{ \frac{\pi}{2} * 0.2, \right.$
 $\left. \frac{\text{ZeroZeroFirst02ibmqmanila}}{\left(\text{OneZeroFirst02ibmqmanila} + \text{ZeroZeroFirst02ibmqmanila} \right)}, \right.$
 $\left\{ \frac{\pi}{2} * 0.4, \frac{\text{ZeroZeroFirst04ibmqmanila}}{\left(\text{OneZeroFirst04ibmqmanila} + \text{ZeroZeroFirst04ibmqmanila} \right)}, \right.$
 $\left\{ \frac{\pi}{2} * 0.6, \right.$
 $\left. \frac{\text{ZeroZeroFirst06ibmqmanila}}{\left(\text{OneZeroFirst06ibmqmanila} + \text{ZeroZeroFirst06ibmqmanila} \right)}, \right.$
 $\left\{ \frac{\pi}{2} * 0.8, \frac{\text{ZeroZeroFirst08ibmqmanila}}{\left(\text{OneZeroFirst08ibmqmanila} + \text{ZeroZeroFirst08ibmqmanila} \right)}, \right.$
 $\left\{ \frac{\pi}{2} * 1, \right.$
 $\left. \frac{\text{ZeroZeroFirst10ibmqmanila}}{\left(\text{OneZeroFirst10ibmqmanila} + \text{ZeroZeroFirst10ibmqmanila} \right)} \right\}$
 Decisivenessibmqmanila = $\left\{ \left\{ -\frac{\pi}{2} * 1, \right. \right.$
 $\left. \frac{\left(\text{OneZeroSecond10ibmqmanila} + \text{ZeroZeroSecond10ibmqmanila} \right)}{8192}, \right.$

$$\left\{-\frac{\pi}{2} * 0.8, (OneZeroSecond08ibmqmanila + ZeroZeroSecond08ibmqmanila) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.6, (OneZeroSecond06ibmqmanila + ZeroZeroSecond06ibmqmanila) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.4, (OneZeroSecond04ibmqmanila + ZeroZeroSecond04ibmqmanila) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.2, (OneZeroSecond02ibmqmanila + ZeroZeroSecond02ibmqmanila) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.0, (OneZeroFirst00ibmqmanila + ZeroZeroFirst00ibmqmanila) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.2, (OneZeroFirst02ibmqmanila + ZeroZeroFirst02ibmqmanila) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.4, (OneZeroFirst04ibmqmanila + ZeroZeroFirst04ibmqmanila) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.6, (OneZeroFirst06ibmqmanila + ZeroZeroFirst06ibmqmanila) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.8, (OneZeroFirst08ibmqmanila + ZeroZeroFirst08ibmqmanila) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 1.0, (OneZeroFirst10ibmqmanila + ZeroZeroFirst10ibmqmanila) / 8192\right\}$$

```
ExpCosSqibmqmanila = ListPlot[CosSqibmqmanila]
```

```
ExpDecisivenessibmqmanila = ListPlot[Decisivenessibmqmanila]
```

```
Out[ ]= 7602
```

```
Out[ ]= 169
```

```
Out[ ]= 229
```

```
Out[ ]= 192
```

```
Out[ ]= 7404
```

```
Out[ ]= 183
```

```
Out[ ]= 222
```

```
Out[ ]= 383
```

```
Out[ ]= 6827
```

```
Out[ ]= 195
```

```
Out[ ]= 224
```

```
Out[ ]= 946
```

```
Out[ ]= 5879
```

```
Out[ ]= 208
```

```
Out[ ]= 269
```

```
Out[ ]= 1836
```

```
Out[ ]= 4732
```

```
Out[ ]= 293
```

Out[]= 399

Out[]= 2768

Out[]= 3625

Out[]= 246

Out[]= 449

Out[]= 3872

Out[]= 2397

Out[]= 331

Out[]= 305

Out[]= 5159

Out[]= 1412

Out[]= 355

Out[]= 367

Out[]= 6058

Out[]= 732

Out[]= 321

Out[]= 401

Out[]= 6738

Out[]= 212

Out[]= 390

Out[]= 429

Out[]= 7161

Out[]= 115

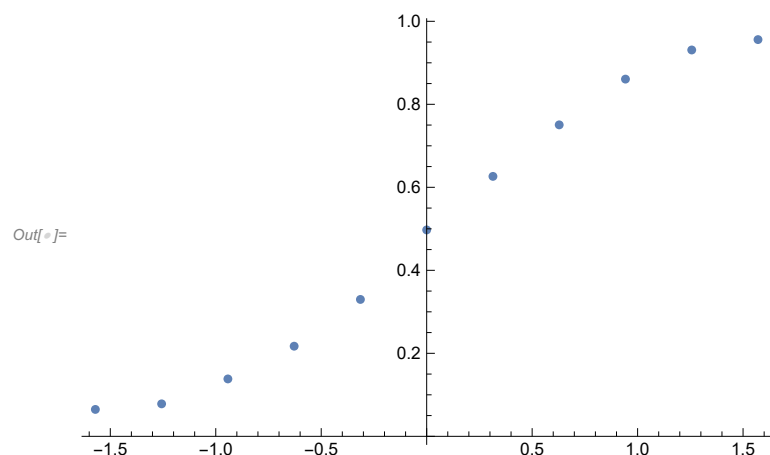
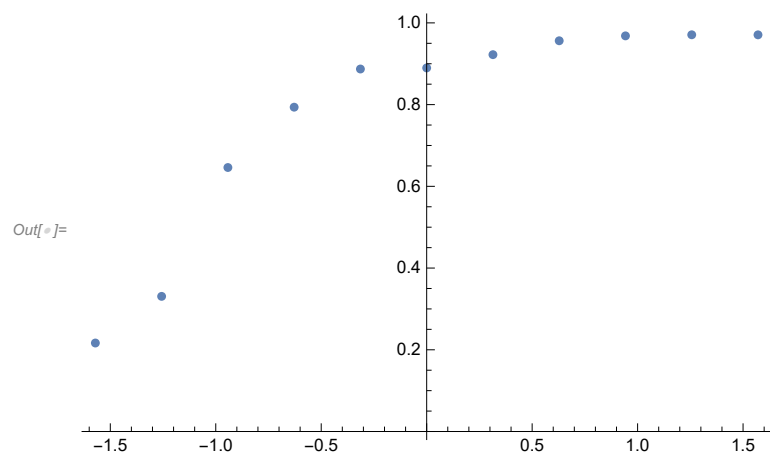
Out[]= 375

Out[]= 416

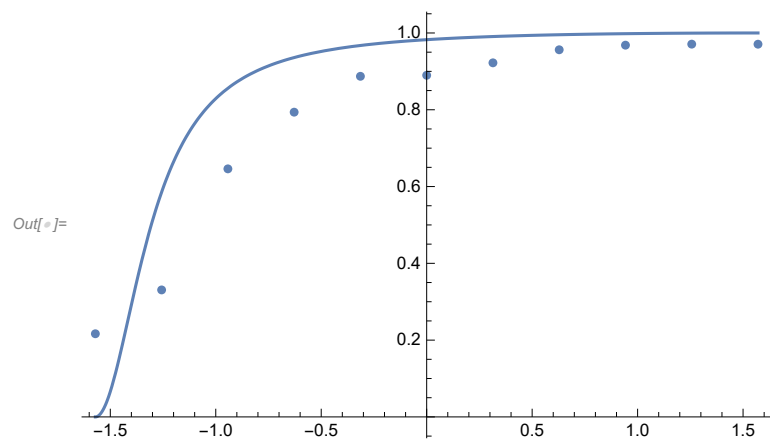
Out[]= 7286

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{115}{531} \right\}, \left\{ -1.25664, \frac{212}{641} \right\}, \left\{ -0.942478, \frac{732}{1133} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1412}{1779} \right\}, \left\{ -0.314159, \frac{2397}{2702} \right\}, \left\{ 0., \frac{3625}{4074} \right\}, \left\{ 0.314159, \frac{676}{733} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{5879}{6148} \right\}, \left\{ 0.942478, \frac{6827}{7051} \right\}, \left\{ 1.25664, \frac{1234}{1271} \right\}, \left\{ \frac{\pi}{2}, \frac{7602}{7831} \right\} \right\}$

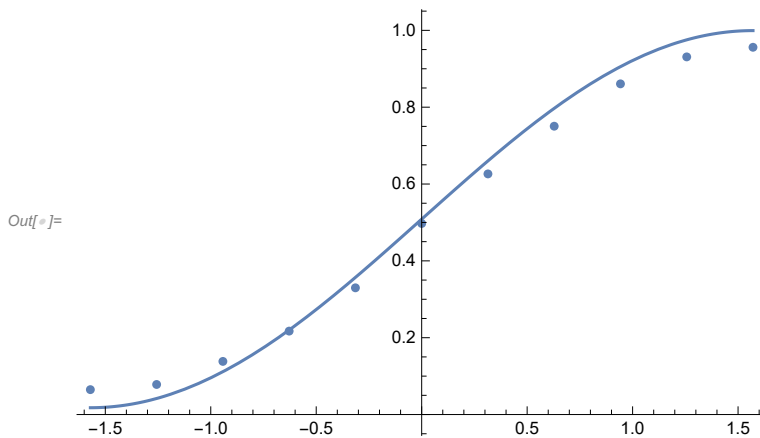
Out[]:= $\left\{ \left\{ -\frac{\pi}{2}, \frac{531}{8192} \right\}, \left\{ -1.25664, \frac{641}{8192} \right\}, \left\{ -0.942478, \frac{1133}{8192} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1779}{8192} \right\}, \left\{ -0.314159, \frac{1351}{4096} \right\}, \left\{ 0., \frac{2037}{4096} \right\}, \left\{ 0.314159, \frac{5131}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{1537}{2048} \right\}, \left\{ 0.942478, \frac{7051}{8192} \right\}, \left\{ 1.25664, \frac{3813}{4096} \right\}, \left\{ 1.5708, \frac{7831}{8192} \right\} \right\}$



In[]:= Show[cosTH, ExpCosSqibmqmanila]



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



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

```
ZeroZeroFirst10ibmqquito = 7708
```

```
ZeroOneFirst10ibmqquito = 172
```

```
OneZeroFirst10ibmqquito = 209
```

```
OneOneFirst10ibmqquito = 103
```

```
ZeroZeroFirst08ibmqquito = 7432
```

```
ZeroOneFirst08ibmqquito = 195
```

```
OneZeroFirst08ibmqquito = 202
```

```
OneOneFirst08ibmqquito = 363
```

```
ZeroZeroFirst06ibmqquito = 6789
```

```
ZeroOneFirst06ibmqquito = 236
```

```
OneZeroFirst06ibmqquito = 262
```

```
OneOneFirst06ibmqquito = 905
```

```
ZeroZeroFirst04ibmqquito = 5845
```

```
ZeroOneFirst04ibmqquito = 346
```

```
OneZeroFirst04ibmqquito = 282
```

```
OneOneFirst04ibmqquito = 1719
```

```
ZeroZeroFirst02ibmqquito = 4717
```

```
ZeroOneFirst02ibmqquito = 423
```

```
OneZeroFirst02ibmqquito = 316
```

```
OneOneFirst02ibmqquito = 2736
```

```
ZeroZeroFirst00ibmqquito = 3658
```

```
ZeroOneFirst00ibmqquito = 437
```

```
OneZeroFirst00ibmqquito = 465
```

```
OneOneFirst00ibmqquito = 3632
```

```
ZeroZeroSecond02ibmqquito = 2455
```

```
ZeroOneSecond02ibmqquito = 496
```

```
OneZeroSecond02ibmqquito = 517
```

```
OneOneSecond02ibmqquito = 4724
```


ZeroZeroSecond04ibmqquito = 1412
 ZeroOneSecond04ibmqquito = 584
 OneZeroSecond04ibmqquito = 593
 OneOneSecond04ibmqquito = 5603

ZeroZeroSecond06ibmqquito = 702
 ZeroOneSecond06ibmqquito = 597
 OneZeroSecond06ibmqquito = 686
 OneOneSecond06ibmqquito = 6207

ZeroZeroSecond08ibmqquito = 198
 ZeroOneSecond08ibmqquito = 629
 OneZeroSecond08ibmqquito = 699
 OneOneSecond08ibmqquito = 6666

ZeroZeroSecond10ibmqquito = 154
 ZeroOneSecond10ibmqquito = 595
 OneZeroSecond10ibmqquito = 696
 OneOneSecond10ibmqquito = 6747

$\text{CosSqibmqquito} = \left\{ \left\{ -\frac{\pi}{2} * 1, \text{ZeroZeroSecond10ibmqquito} / \right. \right.$
 $\quad \left. \left(\text{OneZeroSecond10ibmqquito} + \text{ZeroZeroSecond10ibmqquito} \right) \right\}, \left\{ -\frac{\pi}{2} * 0.8, \right.$
 $\quad \left. \text{ZeroZeroSecond08ibmqquito} / \left(\text{OneZeroSecond08ibmqquito} + \text{ZeroZeroSecond08ibmqquito} \right) \right\},$
 $\left\{ -\frac{\pi}{2} * 0.6, \text{ZeroZeroSecond06ibmqquito} / \right.$
 $\quad \left. \left(\text{OneZeroSecond06ibmqquito} + \text{ZeroZeroSecond06ibmqquito} \right) \right\}, \left\{ -\frac{\pi}{2} * 0.4, \right.$
 $\quad \left. \text{ZeroZeroSecond04ibmqquito} / \left(\text{OneZeroSecond04ibmqquito} + \text{ZeroZeroSecond04ibmqquito} \right) \right\},$
 $\left\{ -\frac{\pi}{2} * 0.2, \text{ZeroZeroSecond02ibmqquito} / \right.$
 $\quad \left. \left(\text{OneZeroSecond02ibmqquito} + \text{ZeroZeroSecond02ibmqquito} \right) \right\}, \left\{ \frac{\pi}{2} * 0.0, \right.$
 $\quad \left. \text{ZeroZeroFirst00ibmqquito} / \left(\text{OneZeroFirst00ibmqquito} + \text{ZeroZeroFirst00ibmqquito} \right) \right\},$
 $\left\{ \frac{\pi}{2} * 0.2, \text{ZeroZeroFirst02ibmqquito} / \right.$
 $\quad \left. \left(\text{OneZeroFirst02ibmqquito} + \text{ZeroZeroFirst02ibmqquito} \right) \right\}, \left\{ \frac{\pi}{2} * 0.4, \right.$
 $\quad \left. \text{ZeroZeroFirst04ibmqquito} / \left(\text{OneZeroFirst04ibmqquito} + \text{ZeroZeroFirst04ibmqquito} \right) \right\},$
 $\left\{ \frac{\pi}{2} * 0.6, \text{ZeroZeroFirst06ibmqquito} / \right.$
 $\quad \left. \left(\text{OneZeroFirst06ibmqquito} + \text{ZeroZeroFirst06ibmqquito} \right) \right\}, \left\{ \frac{\pi}{2} * 0.8, \right.$
 $\quad \left. \text{ZeroZeroFirst08ibmqquito} / \left(\text{OneZeroFirst08ibmqquito} + \text{ZeroZeroFirst08ibmqquito} \right) \right\},$
 $\left\{ \frac{\pi}{2} * 1, \text{ZeroZeroFirst10ibmqquito} / \left(\text{OneZeroFirst10ibmqquito} + \text{ZeroZeroFirst10ibmqquito} \right) \right\} \}$
 $\text{Decisivenessibmqquito} =$
 $\left\{ \left\{ -\frac{\pi}{2} * 1, \left(\text{OneZeroSecond10ibmqquito} + \text{ZeroZeroSecond10ibmqquito} \right) / 8192 \right\}, \right.$

$$\left\{-\frac{\pi}{2} * 0.8, (OneZeroSecond08ibmqquito + ZeroZeroSecond08ibmqquito) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.6, (OneZeroSecond06ibmqquito + ZeroZeroSecond06ibmqquito) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.4, (OneZeroSecond04ibmqquito + ZeroZeroSecond04ibmqquito) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.2, (OneZeroSecond02ibmqquito + ZeroZeroSecond02ibmqquito) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.0, (OneZeroFirst00ibmqquito + ZeroZeroFirst00ibmqquito) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.2, (OneZeroFirst02ibmqquito + ZeroZeroFirst02ibmqquito) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.4, (OneZeroFirst04ibmqquito + ZeroZeroFirst04ibmqquito) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.6, (OneZeroFirst06ibmqquito + ZeroZeroFirst06ibmqquito) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.8, (OneZeroFirst08ibmqquito + ZeroZeroFirst08ibmqquito) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 1.0, (OneZeroFirst10ibmqquito + ZeroZeroFirst10ibmqquito) / 8192\right\}$$

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

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

```
Out[ ]= 7708
```

```
Out[ ]= 172
```

```
Out[ ]= 209
```

```
Out[ ]= 103
```

```
Out[ ]= 7432
```

```
Out[ ]= 195
```

```
Out[ ]= 202
```

```
Out[ ]= 363
```

```
Out[ ]= 6789
```

```
Out[ ]= 236
```

```
Out[ ]= 262
```

```
Out[ ]= 905
```

```
Out[ ]= 5845
```

```
Out[ ]= 346
```

```
Out[ ]= 282
```

```
Out[ ]= 1719
```

```
Out[ ]= 4717
```

$\text{Out}[*]= 423$

$\text{Out}[*]= 316$

$\text{Out}[*]= 2736$

$\text{Out}[*]= 3658$

$\text{Out}[*]= 437$

$\text{Out}[*]= 465$

$\text{Out}[*]= 3632$

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

$\text{Out}[*]= 496$

$\text{Out}[*]= 517$

$\text{Out}[*]= 4724$

$\text{Out}[*]= 1412$

$\text{Out}[*]= 584$

$\text{Out}[*]= 593$

$\text{Out}[*]= 5603$

$\text{Out}[*]= 702$

$\text{Out}[*]= 597$

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

$\text{Out}[*]= 6207$

$\text{Out}[*]= 198$

$\text{Out}[*]= 629$

$\text{Out}[*]= 699$

$\text{Out}[*]= 6666$

$\text{Out}[*]= 154$

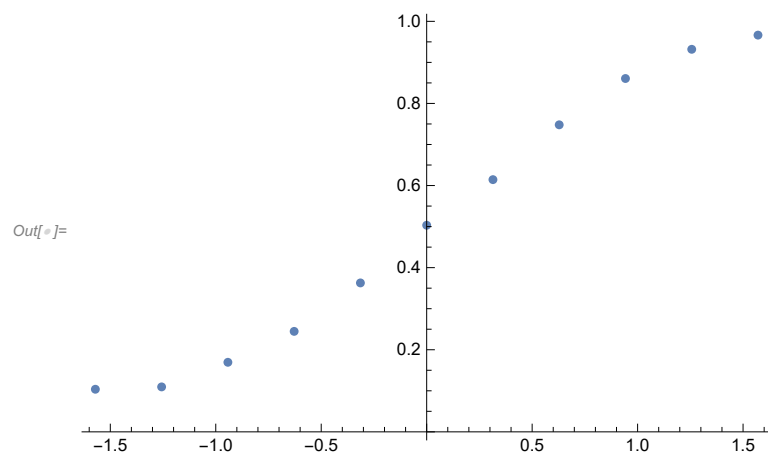
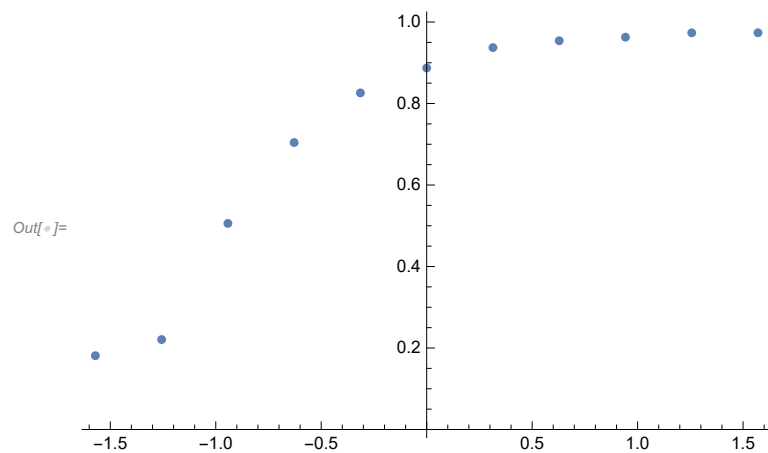
$\text{Out}[*]= 595$

$\text{Out}[*]= 696$

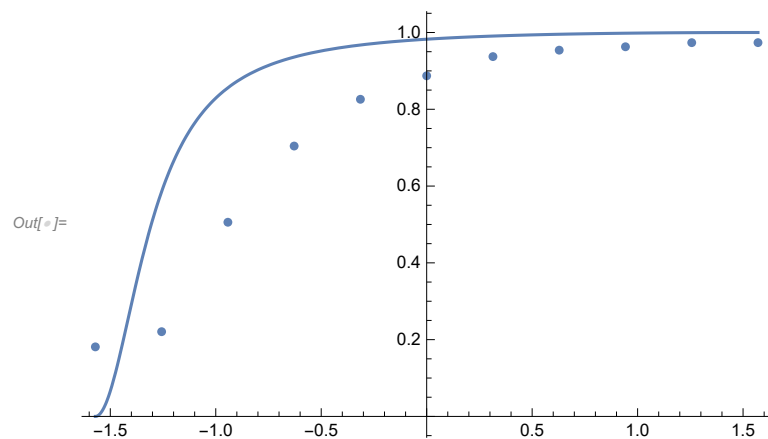
$\text{Out}[*]= 6747$

$\text{Out}[*]= \left\{ \left\{ -\frac{\pi}{2}, \frac{77}{425} \right\}, \left\{ -1.25664, \frac{66}{299} \right\}, \left\{ -0.942478, \frac{351}{694} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1412}{2005} \right\}, \left\{ -0.314159, \frac{2455}{2972} \right\}, \left\{ 0., \frac{118}{133} \right\}, \left\{ 0.314159, \frac{4717}{5033} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{5845}{6127} \right\}, \left\{ 0.942478, \frac{6789}{7051} \right\}, \left\{ 1.25664, \frac{3716}{3817} \right\}, \left\{ \frac{\pi}{2}, \frac{7708}{7917} \right\} \right\}$

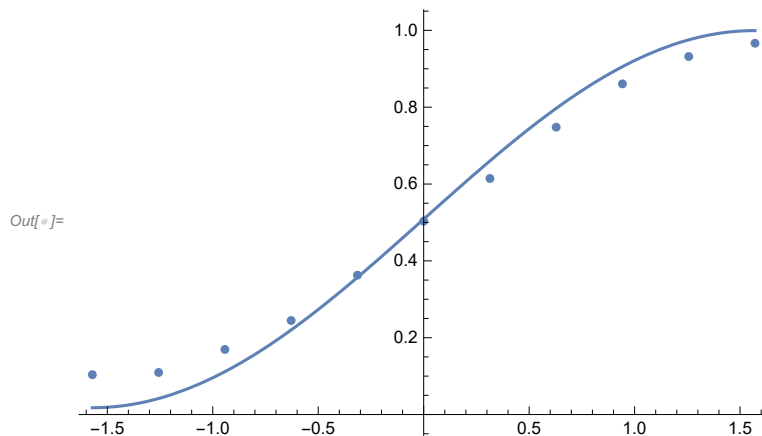
$\text{Out}[*]= \left\{ \left\{ -\frac{\pi}{2}, \frac{425}{4096} \right\}, \left\{ -1.25664, \frac{897}{8192} \right\}, \left\{ -0.942478, \frac{347}{2048} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{2005}{8192} \right\}, \left\{ -0.314159, \frac{743}{2048} \right\}, \left\{ 0., \frac{4123}{8192} \right\}, \left\{ 0.314159, \frac{5033}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6127}{8192} \right\}, \left\{ 0.942478, \frac{7051}{8192} \right\}, \left\{ 1.25664, \frac{3817}{4096} \right\}, \left\{ 1.5708, \frac{7917}{8192} \right\} \right\}$



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



In[]:= Show[decTH, ExpDecisivenessibmqquito]



In[]:= (*ibmq_lima*)

ZeroZeroFirst10ibmq_1lima = 7708

ZeroOneFirst10ibmq_1lima = 172

OneZeroFirst10ibmq_1lima = 191

OneOneFirst10ibmq_1lima = 121

ZeroZeroFirst08ibmq_1lima = 7514

ZeroOneFirst08ibmq_1lima = 182

OneZeroFirst08ibmq_1lima = 196

OneOneFirst08ibmq_1lima = 300

ZeroZeroFirst06ibmq_1lima = 6884

ZeroOneFirst06ibmq_1lima = 219

OneZeroFirst06ibmq_1lima = 251

OneOneFirst06ibmq_1lima = 838

ZeroZeroFirst04ibmq_1lima = 6010

ZeroOneFirst04ibmq_1lima = 244

OneZeroFirst04ibmq_1lima = 277

OneOneFirst04ibmq_1lima = 1661

ZeroZeroFirst02ibmq_1lima = 4905

ZeroOneFirst02ibmq_1lima = 255

OneZeroFirst02ibmq_1lima = 332

OneOneFirst02ibmq_1lima = 2700

ZeroZeroFirst00ibmq_1lima = 3740

ZeroOneFirst00ibmq_1lima = 282

OneZeroFirst00ibmq_1lima = 418

OneOneFirst00ibmq_1lima = 3752

ZeroZeroSecond02ibmq_1lima = 2608

ZeroOneSecond02ibmq_1lima = 339

OneZeroSecond02ibmq_1lima = 407

OneOneSecond02ibmq_1lima = 4838

```

ZeroZeroSecond04ibmqLima = 1587
ZeroOneSecond04ibmqLima = 373
OneZeroSecond04ibmqLima = 527
OneOneSecond04ibmqLima = 5705

```

```

ZeroZeroSecond06ibmqLima = 724
ZeroOneSecond06ibmqLima = 462
OneZeroSecond06ibmqLima = 518
OneOneSecond06ibmqLima = 6488

```

```

ZeroZeroSecond08ibmqLima = 239
ZeroOneSecond08ibmqLima = 417
OneZeroSecond08ibmqLima = 537
OneOneSecond08ibmqLima = 6999

```

```

ZeroZeroSecond10ibmqLima = 103
ZeroOneSecond10ibmqLima = 401
OneZeroSecond10ibmqLima = 506
OneOneSecond10ibmqLima = 7182

```

```

CosSqibmqLima =

```

```

{ { - $\frac{\pi}{2}$  * 1, ZeroZeroSecond10ibmqLima / (OneZeroSecond10ibmqLima + ZeroZeroSecond10ibmqLima) },
  { - $\frac{\pi}{2}$  * 0.8, ZeroZeroSecond08ibmqLima /
    (OneZeroSecond08ibmqLima + ZeroZeroSecond08ibmqLima) }, { - $\frac{\pi}{2}$  * 0.6,
    ZeroZeroSecond06ibmqLima / (OneZeroSecond06ibmqLima + ZeroZeroSecond06ibmqLima) },
  { - $\frac{\pi}{2}$  * 0.4, ZeroZeroSecond04ibmqLima /
    (OneZeroSecond04ibmqLima + ZeroZeroSecond04ibmqLima) }, { - $\frac{\pi}{2}$  * 0.2,
    ZeroZeroSecond02ibmqLima / (OneZeroSecond02ibmqLima + ZeroZeroSecond02ibmqLima) },
  {  $\frac{\pi}{2}$  * 0.0, ZeroZeroFirst00ibmqLima / (OneZeroFirst00ibmqLima + ZeroZeroFirst00ibmqLima) },
  {  $\frac{\pi}{2}$  * 0.2, ZeroZeroFirst02ibmqLima / (OneZeroFirst02ibmqLima + ZeroZeroFirst02ibmqLima) },
  {  $\frac{\pi}{2}$  * 0.4, ZeroZeroFirst04ibmqLima / (OneZeroFirst04ibmqLima + ZeroZeroFirst04ibmqLima) },
  {  $\frac{\pi}{2}$  * 0.6, ZeroZeroFirst06ibmqLima / (OneZeroFirst06ibmqLima + ZeroZeroFirst06ibmqLima) },
  {  $\frac{\pi}{2}$  * 0.8, ZeroZeroFirst08ibmqLima / (OneZeroFirst08ibmqLima + ZeroZeroFirst08ibmqLima) },
  {  $\frac{\pi}{2}$  * 1, ZeroZeroFirst10ibmqLima / (OneZeroFirst10ibmqLima + ZeroZeroFirst10ibmqLima) } }

```

```

DecisivenessibmqLima =

```

```

{ { - $\frac{\pi}{2}$  * 1, (OneZeroSecond10ibmqLima + ZeroZeroSecond10ibmqLima) / 8192 },
  { - $\frac{\pi}{2}$  * 0.8, (OneZeroSecond08ibmqLima + ZeroZeroSecond08ibmqLima) / 8192 },

```

$$\left\{-\frac{\pi}{2} * 0.6, (OneZeroSecond06ibmq\text{lima} + ZeroZeroSecond06ibmq\text{lima}) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.4, (OneZeroSecond04ibmq\text{lima} + ZeroZeroSecond04ibmq\text{lima}) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.2, (OneZeroSecond02ibmq\text{lima} + ZeroZeroSecond02ibmq\text{lima}) / 8192\right\},$$

$$\left\{-\frac{\pi}{2} * 0.0, (OneZeroFirst00ibmq\text{lima} + ZeroZeroFirst00ibmq\text{lima}) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.2, (OneZeroFirst02ibmq\text{lima} + ZeroZeroFirst02ibmq\text{lima}) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.4, (OneZeroFirst04ibmq\text{lima} + ZeroZeroFirst04ibmq\text{lima}) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.6, (OneZeroFirst06ibmq\text{lima} + ZeroZeroFirst06ibmq\text{lima}) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 0.8, (OneZeroFirst08ibmq\text{lima} + ZeroZeroFirst08ibmq\text{lima}) / 8192\right\},$$

$$\left\{\frac{\pi}{2} * 1.0, (OneZeroFirst10ibmq\text{lima} + ZeroZeroFirst10ibmq\text{lima}) / 8192\right\}$$

```
ExpCosSqibmq\text{lima} = ListPlot[CosSqibmq\text{lima}]
```

```
ExpDecisivenessibmq\text{lima} = ListPlot[Decisivenessibmq\text{lima}]
```

```
Out[ ]= 7708
```

```
Out[ ]= 172
```

```
Out[ ]= 191
```

```
Out[ ]= 121
```

```
Out[ ]= 7514
```

```
Out[ ]= 182
```

```
Out[ ]= 196
```

```
Out[ ]= 300
```

```
Out[ ]= 6884
```

```
Out[ ]= 219
```

```
Out[ ]= 251
```

```
Out[ ]= 838
```

```
Out[ ]= 6010
```

```
Out[ ]= 244
```

```
Out[ ]= 277
```

```
Out[ ]= 1661
```

```
Out[ ]= 4905
```

```
Out[ ]= 255
```

```
Out[ ]= 332
```

Out[]= 2700

Out[]= 3740

Out[]= 282

Out[]= 418

Out[]= 3752

Out[]= 2608

Out[]= 339

Out[]= 407

Out[]= 4838

Out[]= 1587

Out[]= 373

Out[]= 527

Out[]= 5705

Out[]= 724

Out[]= 462

Out[]= 518

Out[]= 6488

Out[]= 239

Out[]= 417

Out[]= 537

Out[]= 6999

Out[]= 103

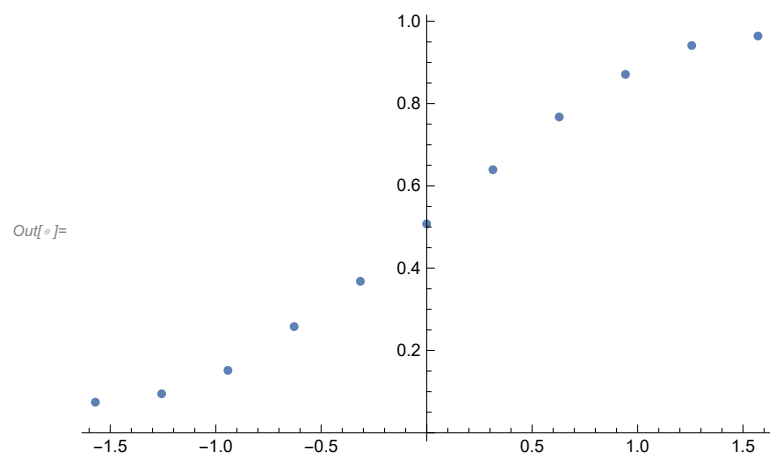
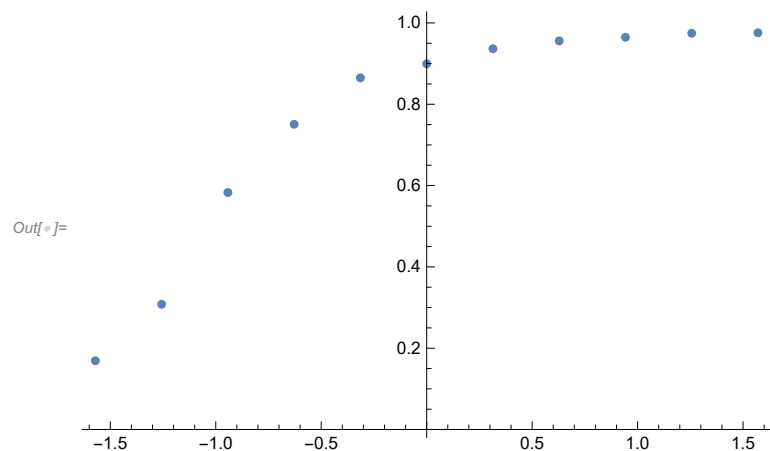
Out[]= 401

Out[]= 506

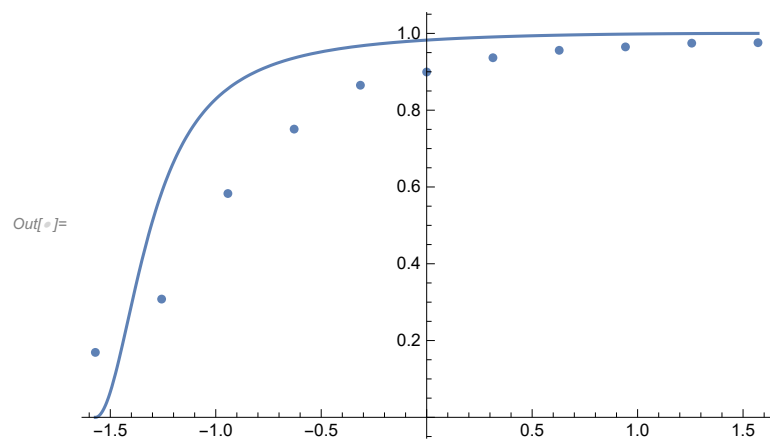
Out[]= 7182

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{103}{609} \right\}, \left\{ -1.25664, \frac{239}{776} \right\}, \left\{ -0.942478, \frac{362}{621} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1587}{2114} \right\}, \left\{ -0.314159, \frac{2608}{3015} \right\}, \left\{ 0., \frac{170}{189} \right\}, \left\{ 0.314159, \frac{4905}{5237} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6010}{6287} \right\}, \left\{ 0.942478, \frac{6884}{7135} \right\}, \left\{ 1.25664, \frac{3757}{3855} \right\}, \left\{ \frac{\pi}{2}, \frac{7708}{7899} \right\} \right\}$

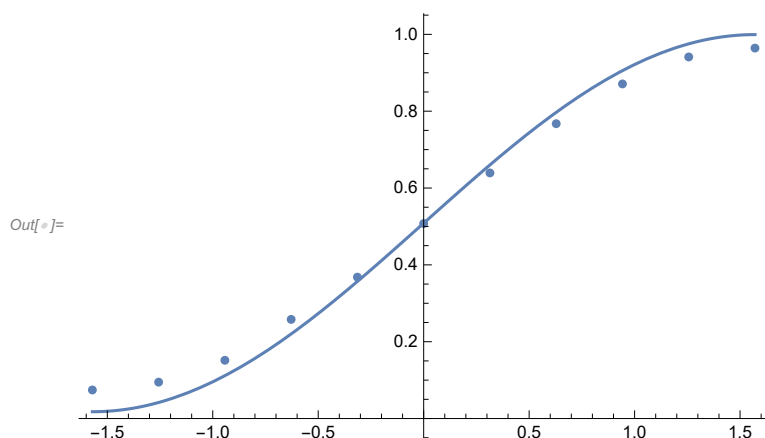
Out[]:= $\left\{ \left\{ -\frac{\pi}{2}, \frac{609}{8192} \right\}, \left\{ -1.25664, \frac{97}{1024} \right\}, \left\{ -0.942478, \frac{621}{4096} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{1057}{4096} \right\}, \left\{ -0.314159, \frac{3015}{8192} \right\}, \left\{ 0., \frac{2079}{4096} \right\}, \left\{ 0.314159, \frac{5237}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6287}{8192} \right\}, \left\{ 0.942478, \frac{7135}{8192} \right\}, \left\{ 1.25664, \frac{3855}{4096} \right\}, \left\{ 1.5708, \frac{7899}{8192} \right\} \right\}$



In[]:= Show[cosh, ExpCosSqbmqqlima]



In[]:= Show[decTH, ExpDecisivenessibmqIima]



In[]:= (*ibmq_qasm_simulator*)

ZeroZeroFirst10ibmqqasmsimulator = 8186
 ZeroOneFirst10ibmqqasmsimulator = 6
 OneZeroFirst10ibmqqasmsimulator = 0
 OneOneFirst10ibmqqasmsimulator = 0

ZeroZeroFirst08ibmqqasmsimulator = 7978
 ZeroOneFirst08ibmqqasmsimulator = 2
 OneZeroFirst08ibmqqasmsimulator = 3
 OneOneFirst08ibmqqasmsimulator = 209

ZeroZeroFirst06ibmqqasmsimulator = 7422
 ZeroOneFirst06ibmqqasmsimulator = 10
 OneZeroFirst06ibmqqasmsimulator = 12
 OneOneFirst06ibmqqasmsimulator = 748

ZeroZeroFirst04ibmqqasmsimulator = 6581
 ZeroOneFirst04ibmqqasmsimulator = 5
 OneZeroFirst04ibmqqasmsimulator = 21
 OneOneFirst04ibmqqasmsimulator = 1585

ZeroZeroFirst02ibmqqasmsimulator = 5353
 ZeroOneFirst02ibmqqasmsimulator = 3
 OneZeroFirst02ibmqqasmsimulator = 61
 OneOneFirst02ibmqqasmsimulator = 2775

ZeroZeroFirst00ibmqqasmsimulator = 4178
 ZeroOneFirst00ibmqqasmsimulator = 5
 OneZeroFirst00ibmqqasmsimulator = 78
 OneOneFirst00ibmqqasmsimulator = 3931

ZeroZeroSecond02ibmqqasmsimulator = 2829
 ZeroOneSecond02ibmqqasmsimulator = 1
 OneZeroSecond02ibmqqasmsimulator = 85
 OneOneSecond02ibmqqasmsimulator = 5277

```

ZeroZeroSecond04ibmqqasmsimulator = 1727
ZeroOneSecond04ibmqqasmsimulator = 0
OneZeroSecond04ibmqqasmsimulator = 105
OneOneSecond04ibmqqasmsimulator = 6360

```

```

ZeroZeroSecond06ibmqqasmsimulator = 754
ZeroOneSecond06ibmqqasmsimulator = 0
OneZeroSecond06ibmqqasmsimulator = 115
OneOneSecond06ibmqqasmsimulator = 7323

```

```

ZeroZeroSecond08ibmqqasmsimulator = 179
ZeroOneSecond08ibmqqasmsimulator = 0
OneZeroSecond08ibmqqasmsimulator = 130
OneOneSecond08ibmqqasmsimulator = 7883

```

```

ZeroZeroSecond10ibmqqasmsimulator = 0
ZeroOneSecond10ibmqqasmsimulator = 0
OneZeroSecond10ibmqqasmsimulator = 136
OneOneSecond10ibmqqasmsimulator = 8056

```

```

CosSqibmqqasmsimulator = { { - $\frac{\pi}{2}$  * 1, ZeroZeroSecond10ibmqqasmsimulator /
    (OneZeroSecond10ibmqqasmsimulator + ZeroZeroSecond10ibmqqasmsimulator) },
  { - $\frac{\pi}{2}$  * 0.8, ZeroZeroSecond08ibmqqasmsimulator /
    (OneZeroSecond08ibmqqasmsimulator + ZeroZeroSecond08ibmqqasmsimulator) },
  { - $\frac{\pi}{2}$  * 0.6, ZeroZeroSecond06ibmqqasmsimulator /
    (OneZeroSecond06ibmqqasmsimulator + ZeroZeroSecond06ibmqqasmsimulator) },
  { - $\frac{\pi}{2}$  * 0.4, ZeroZeroSecond04ibmqqasmsimulator /
    (OneZeroSecond04ibmqqasmsimulator + ZeroZeroSecond04ibmqqasmsimulator) },
  { - $\frac{\pi}{2}$  * 0.2, ZeroZeroSecond02ibmqqasmsimulator /
    (OneZeroSecond02ibmqqasmsimulator + ZeroZeroSecond02ibmqqasmsimulator) },
  {  $\frac{\pi}{2}$  * 0.0, ZeroZeroFirst00ibmqqasmsimulator /
    (OneZeroFirst00ibmqqasmsimulator + ZeroZeroFirst00ibmqqasmsimulator) },
  {  $\frac{\pi}{2}$  * 0.2, ZeroZeroFirst02ibmqqasmsimulator /
    (OneZeroFirst02ibmqqasmsimulator + ZeroZeroFirst02ibmqqasmsimulator) },
  {  $\frac{\pi}{2}$  * 0.4, ZeroZeroFirst04ibmqqasmsimulator /
    (OneZeroFirst04ibmqqasmsimulator + ZeroZeroFirst04ibmqqasmsimulator) },
  {  $\frac{\pi}{2}$  * 0.6, ZeroZeroFirst06ibmqqasmsimulator /
    (OneZeroFirst06ibmqqasmsimulator + ZeroZeroFirst06ibmqqasmsimulator) },
  {  $\frac{\pi}{2}$  * 0.8, ZeroZeroFirst08ibmqqasmsimulator /
    (OneZeroFirst08ibmqqasmsimulator + ZeroZeroFirst08ibmqqasmsimulator) },

```

```

{ $-\frac{\pi}{2} * 1$ , ZeroZeroFirst10ibmqqasmsimulator /
  (OneZeroFirst10ibmqqasmsimulator + ZeroZeroFirst10ibmqqasmsimulator) }}
Decisivenessibmqqasmsimulator = { $-\frac{\pi}{2} * 1$ ,
  (OneZeroSecond10ibmqqasmsimulator + ZeroZeroSecond10ibmqqasmsimulator) / 8192},
{ $-\frac{\pi}{2} * 0.8$ , (OneZeroSecond08ibmqqasmsimulator + ZeroZeroSecond08ibmqqasmsimulator) / 8192},
{ $-\frac{\pi}{2} * 0.6$ , (OneZeroSecond06ibmqqasmsimulator + ZeroZeroSecond06ibmqqasmsimulator) / 8192},
{ $-\frac{\pi}{2} * 0.4$ , (OneZeroSecond04ibmqqasmsimulator + ZeroZeroSecond04ibmqqasmsimulator) / 8192},
{ $-\frac{\pi}{2} * 0.2$ , (OneZeroSecond02ibmqqasmsimulator + ZeroZeroSecond02ibmqqasmsimulator) / 8192},
{ $-\frac{\pi}{2} * 0.0$ , (OneZeroFirst00ibmqqasmsimulator + ZeroZeroFirst00ibmqqasmsimulator) / 8192},
{ $\frac{\pi}{2} * 0.2$ , (OneZeroFirst02ibmqqasmsimulator + ZeroZeroFirst02ibmqqasmsimulator) / 8192},
{ $\frac{\pi}{2} * 0.4$ , (OneZeroFirst04ibmqqasmsimulator + ZeroZeroFirst04ibmqqasmsimulator) / 8192},
{ $\frac{\pi}{2} * 0.6$ , (OneZeroFirst06ibmqqasmsimulator + ZeroZeroFirst06ibmqqasmsimulator) / 8192},
{ $\frac{\pi}{2} * 0.8$ , (OneZeroFirst08ibmqqasmsimulator + ZeroZeroFirst08ibmqqasmsimulator) / 8192},
{ $\frac{\pi}{2} * 1.0$ , (OneZeroFirst10ibmqqasmsimulator + ZeroZeroFirst10ibmqqasmsimulator) / 8192}}
ExpCosSqibmqqasmsimulator = ListPlot[CosSqibmqqasmsimulator]
ExpDecisivenessibmqqasmsimulator = ListPlot[Decisivenessibmqqasmsimulator]

```

Out[]= 8186

Out[]= 6

Out[]= 0

Out[]= 0

Out[]= 7978

Out[]= 2

Out[]= 3

Out[]= 209

Out[]= 7422

Out[]= 10

Out[]= 12

Out[]= 748

Out[]= 6581

Out[]= 5

Out[]= 21

Out[]= 1585

Out[]= 5353

Out[]= 3

Out[]= 61

Out[]= 2775

Out[]= 4178

Out[]= 5

Out[]= 78

Out[]= 3931

Out[]= 2829

Out[]= 1

Out[]= 85

Out[]= 5277

Out[]= 1727

Out[]= 0

Out[]= 105

Out[]= 6360

Out[]= 754

Out[]= 0

Out[]= 115

Out[]= 7323

Out[]= 179

Out[]= 0

Out[]= 130

Out[]= 7883

Out[]= 0

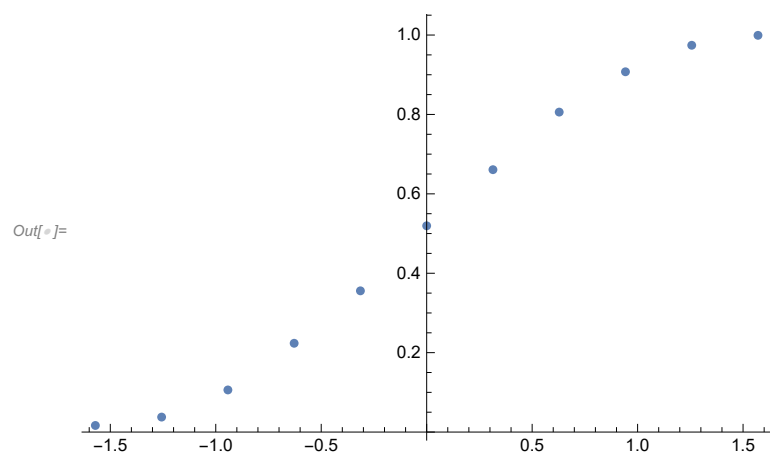
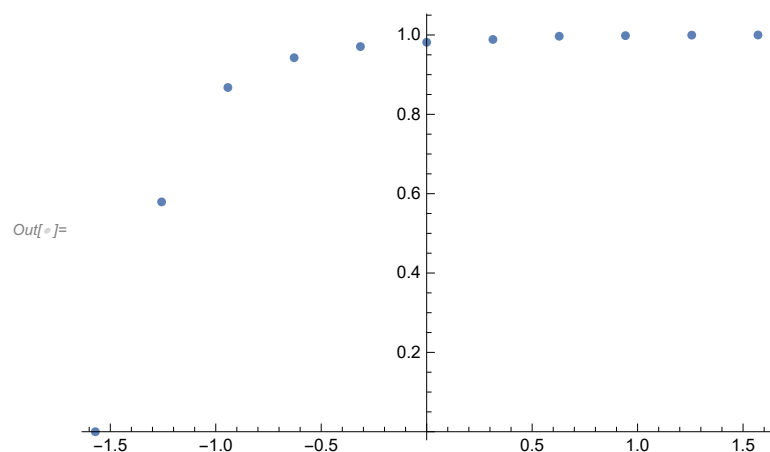
Out[]= 0

Out[]= 136

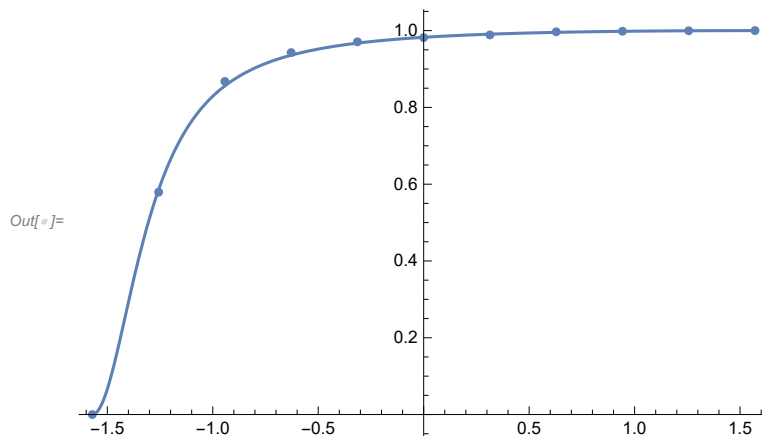
Out[]= 8056

$$\text{Out}[*]= \left\{ \left\{ -\frac{\pi}{2}, 0 \right\}, \left\{ -1.25664, \frac{179}{309} \right\}, \left\{ -0.942478, \frac{754}{869} \right\}, \right. \\ \left. \left\{ -0.628319, \frac{1727}{1832} \right\}, \left\{ -0.314159, \frac{2829}{2914} \right\}, \left\{ 0., \frac{2089}{2128} \right\}, \left\{ 0.314159, \frac{5353}{5414} \right\}, \right. \\ \left. \left\{ 0.628319, \frac{6581}{6602} \right\}, \left\{ 0.942478, \frac{1237}{1239} \right\}, \left\{ 1.25664, \frac{7978}{7981} \right\}, \left\{ \frac{\pi}{2}, 1 \right\} \right\}$$

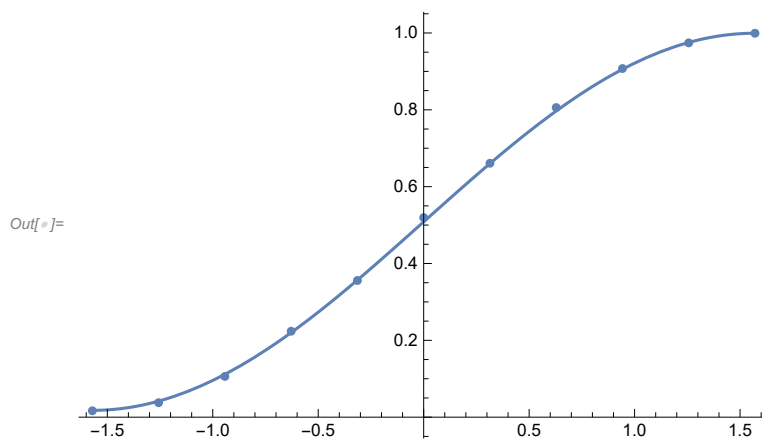
$$\text{Out}[*]= \left\{ \left\{ -\frac{\pi}{2}, \frac{17}{1024} \right\}, \left\{ -1.25664, \frac{309}{8192} \right\}, \left\{ -0.942478, \frac{869}{8192} \right\}, \right. \\ \left. \left\{ -0.628319, \frac{229}{1024} \right\}, \left\{ -0.314159, \frac{1457}{4096} \right\}, \left\{ 0., \frac{133}{256} \right\}, \left\{ 0.314159, \frac{2707}{4096} \right\}, \right. \\ \left. \left\{ 0.628319, \frac{3301}{4096} \right\}, \left\{ 0.942478, \frac{3717}{4096} \right\}, \left\{ 1.25664, \frac{7981}{8192} \right\}, \left\{ 1.5708, \frac{4093}{4096} \right\} \right\}$$



In[]:= Show[cosTH, ExpCosSqibmqqasmsimulator]



In[]:= Show[decTH, ExpDecisivenessibmqqasmsimulator]



In[]:= (*ibmq_belem*)

ZeroZeroFirst10ibmqbelem = 7199

ZeroOneFirst10ibmqbelem = 233

OneZeroFirst10ibmqbelem = 373

OneOneFirst10ibmqbelem = 387

ZeroZeroFirst08ibmqbelem = 7107

ZeroOneFirst08ibmqbelem = 226

OneZeroFirst08ibmqbelem = 322

OneOneFirst08ibmqbelem = 537

ZeroZeroFirst06ibmqbelem = 6464

ZeroOneFirst06ibmqbelem = 291

OneZeroFirst06ibmqbelem = 386

OneOneFirst06ibmqbelem = 1051

ZeroZeroFirst04ibmqbelem = 5729

ZeroOneFirst04ibmqbelem = 337

OneZeroFirst04ibmqbelem = 296

OneOneFirst04ibmqbelem = 1830

```

ZeroZeroFirst02ibmqbelem = 4723
ZeroOneFirst02ibmqbelem = 370
OneZeroFirst02ibmqbelem = 360
OneOneFirst02ibmqbelem = 2739

```

```

ZeroZeroFirst00ibmqbelem = 3659
ZeroOneFirst00ibmqbelem = 364
OneZeroFirst00ibmqbelem = 397
OneOneFirst00ibmqbelem = 3772

```

```

ZeroZeroSecond02ibmqbelem = 2499
ZeroOneSecond02ibmqbelem = 457
OneZeroSecond02ibmqbelem = 474
OneOneSecond02ibmqbelem = 4762

```

```

ZeroZeroSecond04ibmqbelem = 1552
ZeroOneSecond04ibmqbelem = 484
OneZeroSecond04ibmqbelem = 528
OneOneSecond04ibmqbelem = 5628

```

```

ZeroZeroSecond06ibmqbelem = 842
ZeroOneSecond06ibmqbelem = 462
OneZeroSecond06ibmqbelem = 549
OneOneSecond06ibmqbelem = 6339

```

```

ZeroZeroSecond08ibmqbelem = 427
ZeroOneSecond08ibmqbelem = 514
OneZeroSecond08ibmqbelem = 542
OneOneSecond08ibmqbelem = 6709

```

```

ZeroZeroSecond10ibmqbelem = 288
ZeroOneSecond10ibmqbelem = 563
OneZeroSecond10ibmqbelem = 550
OneOneSecond10ibmqbelem = 6791

```

```

CosSqibmqbelem = { {-  $\frac{\pi}{2} * 1$ , ZeroZeroSecond10ibmqbelem /
  (OneZeroSecond10ibmqbelem + ZeroZeroSecond10ibmqbelem) }, {-  $\frac{\pi}{2} * 0.8$ ,
  ZeroZeroSecond08ibmqbelem / (OneZeroSecond08ibmqbelem + ZeroZeroSecond08ibmqbelem) },
  {-  $\frac{\pi}{2} * 0.6$ , ZeroZeroSecond06ibmqbelem /
  (OneZeroSecond06ibmqbelem + ZeroZeroSecond06ibmqbelem) }, {-  $\frac{\pi}{2} * 0.4$ ,
  ZeroZeroSecond04ibmqbelem / (OneZeroSecond04ibmqbelem + ZeroZeroSecond04ibmqbelem) },
  {-  $\frac{\pi}{2} * 0.2$ , ZeroZeroSecond02ibmqbelem /
  (OneZeroSecond02ibmqbelem + ZeroZeroSecond02ibmqbelem) }, {  $\frac{\pi}{2} * 0.0$ ,
  ZeroZeroFirst00ibmqbelem / (OneZeroFirst00ibmqbelem + ZeroZeroFirst00ibmqbelem) },

```


$$\left\{ \frac{\pi}{2} * 0.2, \text{ZeroZeroFirst02ibmqbelem} / \right. \\ \left. (\text{OneZeroFirst02ibmqbelem} + \text{ZeroZeroFirst02ibmqbelem}) \right\}, \left\{ \frac{\pi}{2} * 0.4, \right. \\ \left. \text{ZeroZeroFirst04ibmqbelem} / (\text{OneZeroFirst04ibmqbelem} + \text{ZeroZeroFirst04ibmqbelem}) \right\}, \\ \left\{ \frac{\pi}{2} * 0.6, \text{ZeroZeroFirst06ibmqbelem} / \right. \\ \left. (\text{OneZeroFirst06ibmqbelem} + \text{ZeroZeroFirst06ibmqbelem}) \right\}, \left\{ \frac{\pi}{2} * 0.8, \right. \\ \left. \text{ZeroZeroFirst08ibmqbelem} / (\text{OneZeroFirst08ibmqbelem} + \text{ZeroZeroFirst08ibmqbelem}) \right\}, \\ \left\{ \frac{\pi}{2} * 1, \text{ZeroZeroFirst10ibmqbelem} / (\text{OneZeroFirst10ibmqbelem} + \text{ZeroZeroFirst10ibmqbelem}) \right\} \}$$

Decisivenessibmqbelem =

$$\left\{ \left\{ -\frac{\pi}{2} * 1, (\text{OneZeroSecond10ibmqbelem} + \text{ZeroZeroSecond10ibmqbelem}) / 8192 \right\}, \right. \\ \left\{ -\frac{\pi}{2} * 0.8, (\text{OneZeroSecond08ibmqbelem} + \text{ZeroZeroSecond08ibmqbelem}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.6, (\text{OneZeroSecond06ibmqbelem} + \text{ZeroZeroSecond06ibmqbelem}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.4, (\text{OneZeroSecond04ibmqbelem} + \text{ZeroZeroSecond04ibmqbelem}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.2, (\text{OneZeroSecond02ibmqbelem} + \text{ZeroZeroSecond02ibmqbelem}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.0, (\text{OneZeroFirst00ibmqbelem} + \text{ZeroZeroFirst00ibmqbelem}) / 8192 \right\}, \\ \left\{ \frac{\pi}{2} * 0.2, (\text{OneZeroFirst02ibmqbelem} + \text{ZeroZeroFirst02ibmqbelem}) / 8192 \right\}, \\ \left\{ \frac{\pi}{2} * 0.4, (\text{OneZeroFirst04ibmqbelem} + \text{ZeroZeroFirst04ibmqbelem}) / 8192 \right\}, \\ \left\{ \frac{\pi}{2} * 0.6, (\text{OneZeroFirst06ibmqbelem} + \text{ZeroZeroFirst06ibmqbelem}) / 8192 \right\}, \\ \left\{ \frac{\pi}{2} * 0.8, (\text{OneZeroFirst08ibmqbelem} + \text{ZeroZeroFirst08ibmqbelem}) / 8192 \right\}, \\ \left. \left\{ \frac{\pi}{2} * 1.0, (\text{OneZeroFirst10ibmqbelem} + \text{ZeroZeroFirst10ibmqbelem}) / 8192 \right\} \right\}$$

ExpCosSqibmqbelem = ListPlot[CosSqibmqbelem]

ExpDecisivenessibmqbelem = ListPlot[Decisivenessibmqbelem]

Out[]= 7199

Out[]= 233

Out[]= 373

Out[]= 387

Out[]= 7107

Out[]= 226

Out[]= 322

Out[]= 537

Out[]= 6464

Out[]= 291

Out[]= 386

Out[]= 1051

Out[]= 5729

Out[]= 337

Out[]= 296

Out[]= 1830

Out[]= 4723

Out[]= 370

Out[]= 360

Out[]= 2739

Out[]= 3659

Out[]= 364

Out[]= 397

Out[]= 3772

Out[]= 2499

Out[]= 457

Out[]= 474

Out[]= 4762

Out[]= 1552

Out[]= 484

Out[]= 528

Out[]= 5628

Out[]= 842

Out[]= 462

Out[]= 549

Out[]= 6339

Out[]= 427

Out[]= 514

Out[]= 542

Out[]= 6709

Out[]= 288

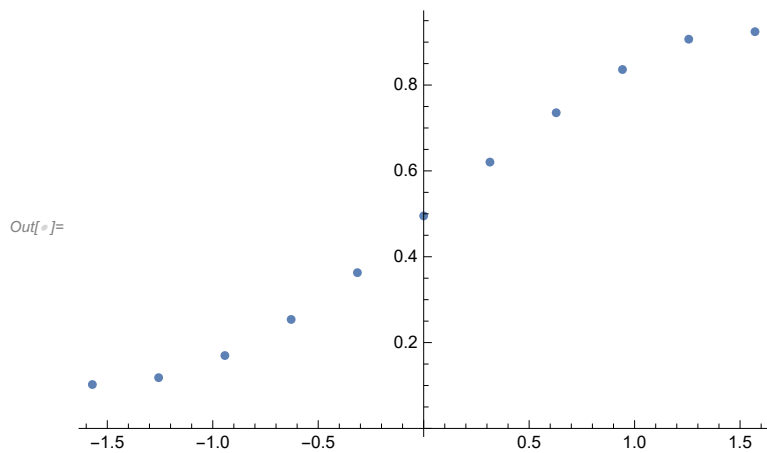
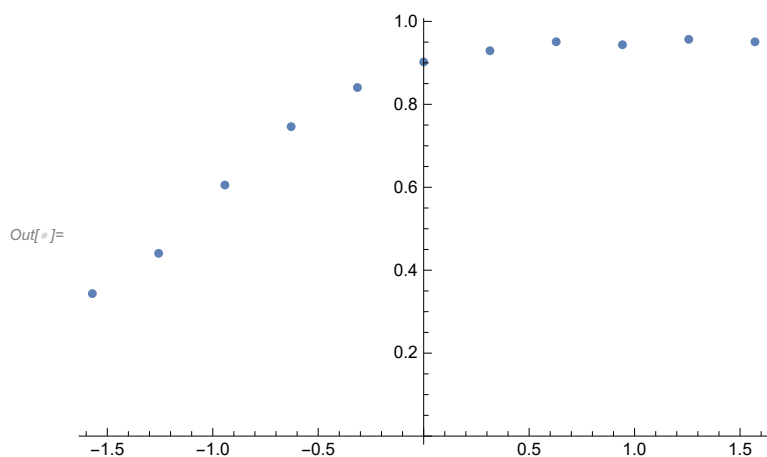
Out[]= 563

Out[]= 550

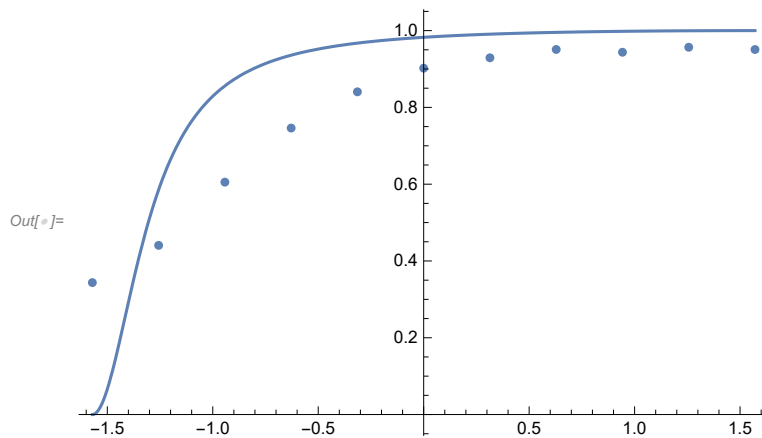
Out[]= 6791

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{144}{419} \right\}, \left\{ -1.25664, \frac{427}{969} \right\}, \left\{ -0.942478, \frac{842}{1391} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{97}{130} \right\}, \left\{ -0.314159, \frac{833}{991} \right\}, \left\{ 0., \frac{3659}{4056} \right\}, \left\{ 0.314159, \frac{4723}{5083} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{5729}{6025} \right\}, \left\{ 0.942478, \frac{3232}{3425} \right\}, \left\{ 1.25664, \frac{309}{323} \right\}, \left\{ \frac{\pi}{2}, \frac{7199}{7572} \right\} \right\}$

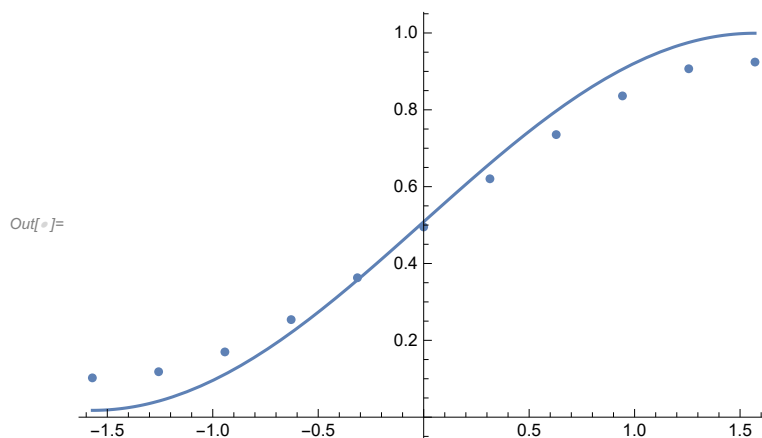
Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{419}{4096} \right\}, \left\{ -1.25664, \frac{969}{8192} \right\}, \left\{ -0.942478, \frac{1391}{8192} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{65}{256} \right\}, \left\{ -0.314159, \frac{2973}{8192} \right\}, \left\{ 0., \frac{507}{1024} \right\}, \left\{ 0.314159, \frac{5083}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6025}{8192} \right\}, \left\{ 0.942478, \frac{3425}{4096} \right\}, \left\{ 1.25664, \frac{7429}{8192} \right\}, \left\{ 1.5708, \frac{1893}{2048} \right\} \right\}$



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



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



```
{"O", "Δ", "*", "◇", "□", "▽", "⊕", "⊙"}
```



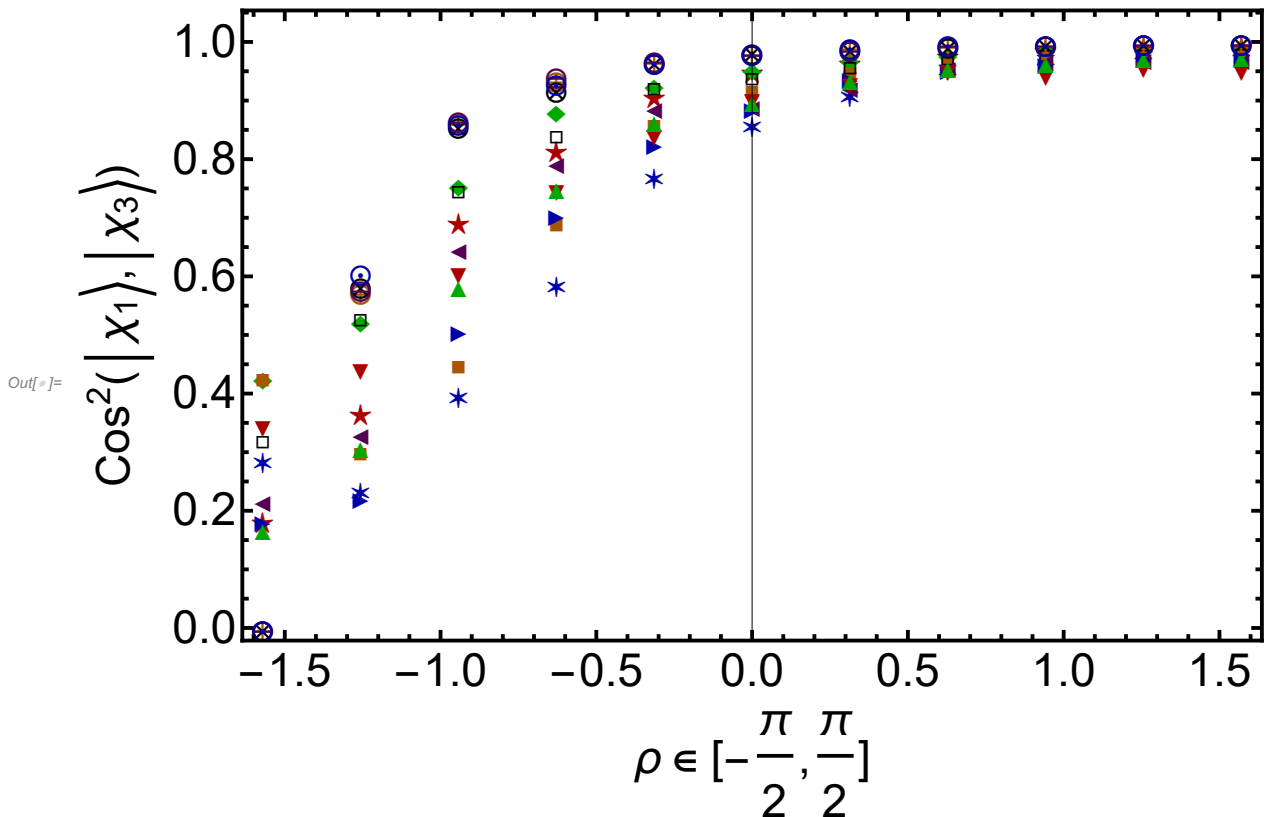
```
In[ ]:= fm[name_String, size_ : 8] :=
  ResourceFunction["PolygonMarker"][name, Offset[size], EdgeForm[]];

ListPlot[Table[Accumulate@RandomReal[1, 10] + i, {i, 6}], PlotMarkers -> fm /@
  {"Triangle", "Y", "Diamond", "ThreePointedStar", "FivePointedStarSlim", "TripleCross"},
  Joined -> True, PlotStyle -> ColorData[52, "ColorList"],
  PlotLegends -> PointLegend[Automatic, LegendMarkerSize -> {50, 37},
  LegendLayout -> (Column[Row /@ #, Spacings -> -1] &)], ImageSize -> 450]
```

```

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⟩)}, {"ρ ∈ [-π/2, π/2]"}, {""}},
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}}]

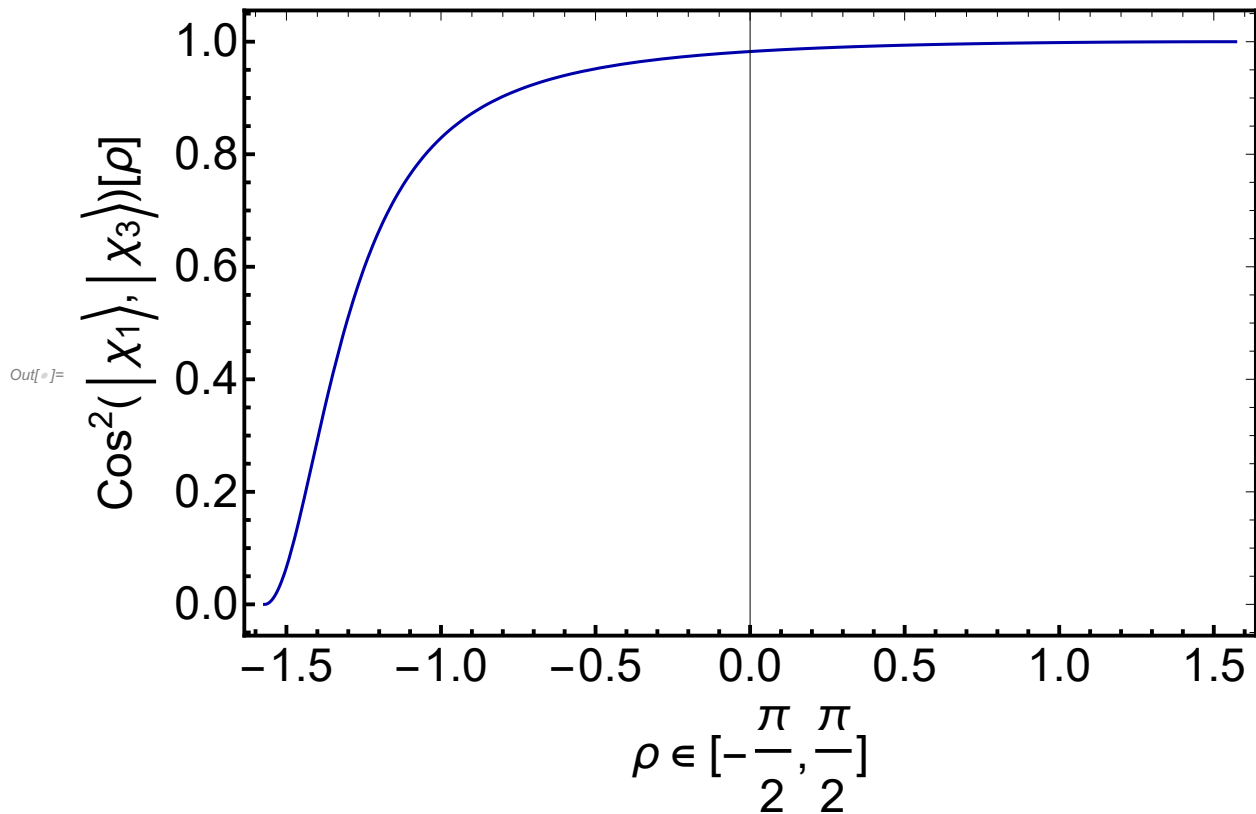
```



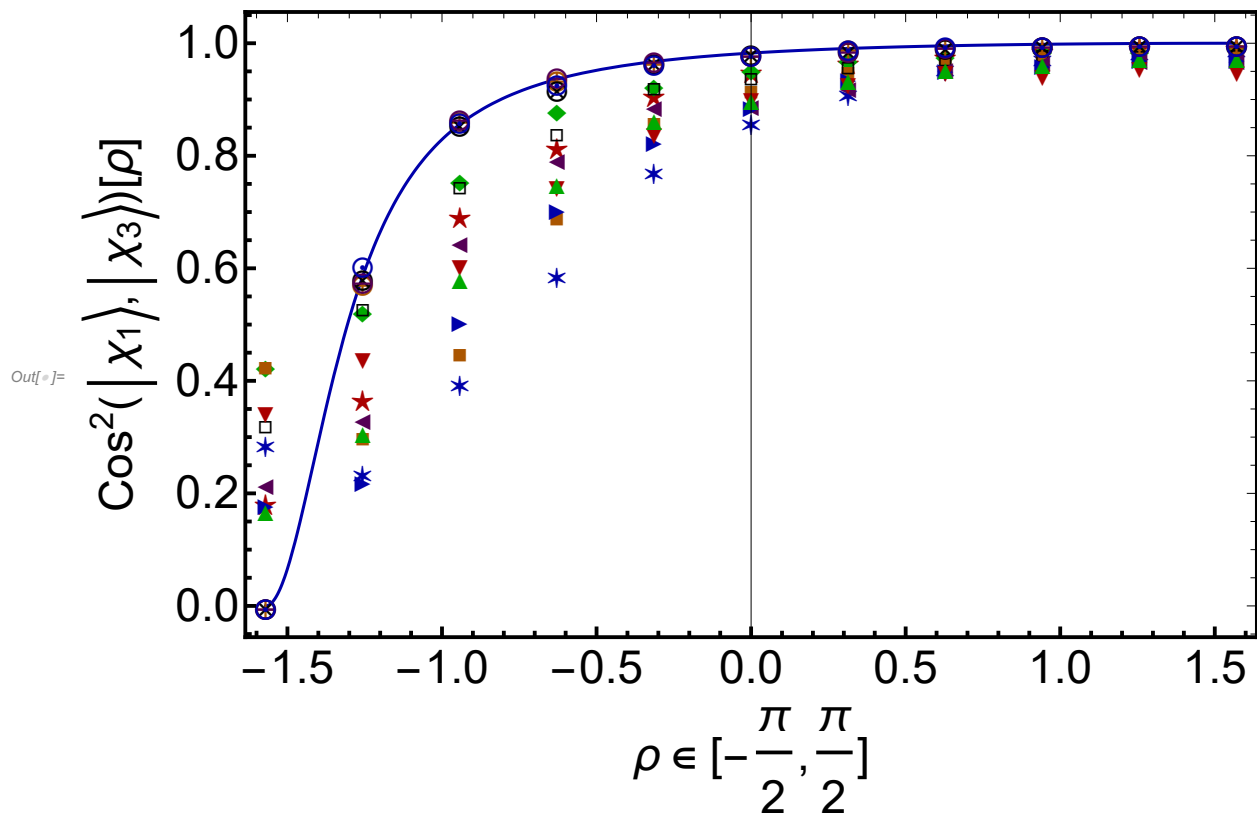
```

In[ ]:= CosSqTheory = Plot[Cos13F[ $\pi/2 - 0.7$ ,  $\pi/2$ , x], {x,  $-\pi/2$ ,  $\pi/2$ },
  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 → {{ $\text{"Cos}^2(|\chi_1\rangle, |\chi_3\rangle)[\rho]$ }, { $\rho \in [-\frac{\pi}{2}, \frac{\pi}{2}]$ }},
  LabelStyle → {FontWeight → "Bold", FontSize → 25},
  ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]

```



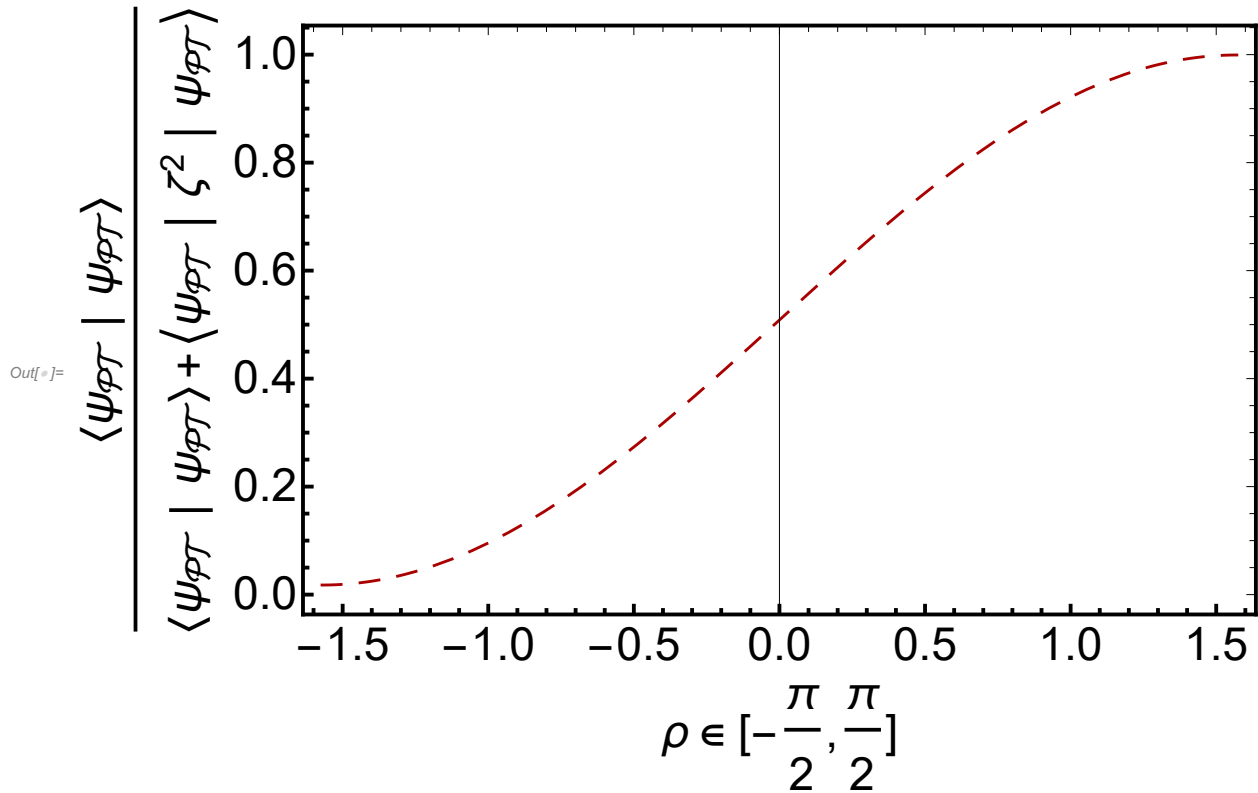
```
In[ ]:= p1 = Show[CosSqTheory, CosSqExperiment]
```



```

In[ ]:= DecisivenessTheory = Plot[DecisiveProbability[7.51,  $\pi/2 - 0.7$ ,  $\pi/2$ , x], {x,  $-\pi/2$ ,  $\pi/2$ },
  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 → {{
     $\frac{\langle \psi_{\mathcal{PT}} | \psi_{\mathcal{PT}} \rangle}{\langle \psi_{\mathcal{PT}} | \psi_{\mathcal{PT}} \rangle + \langle \psi_{\mathcal{PT}} | \xi^2 | \psi_{\mathcal{PT}} \rangle}$ ,
    { $\rho \in [-\frac{\pi}{2}, \frac{\pi}{2}]$ }, {""}},
  LabelStyle → {FontWeight → "Bold", FontSize → 25},
  ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]

```

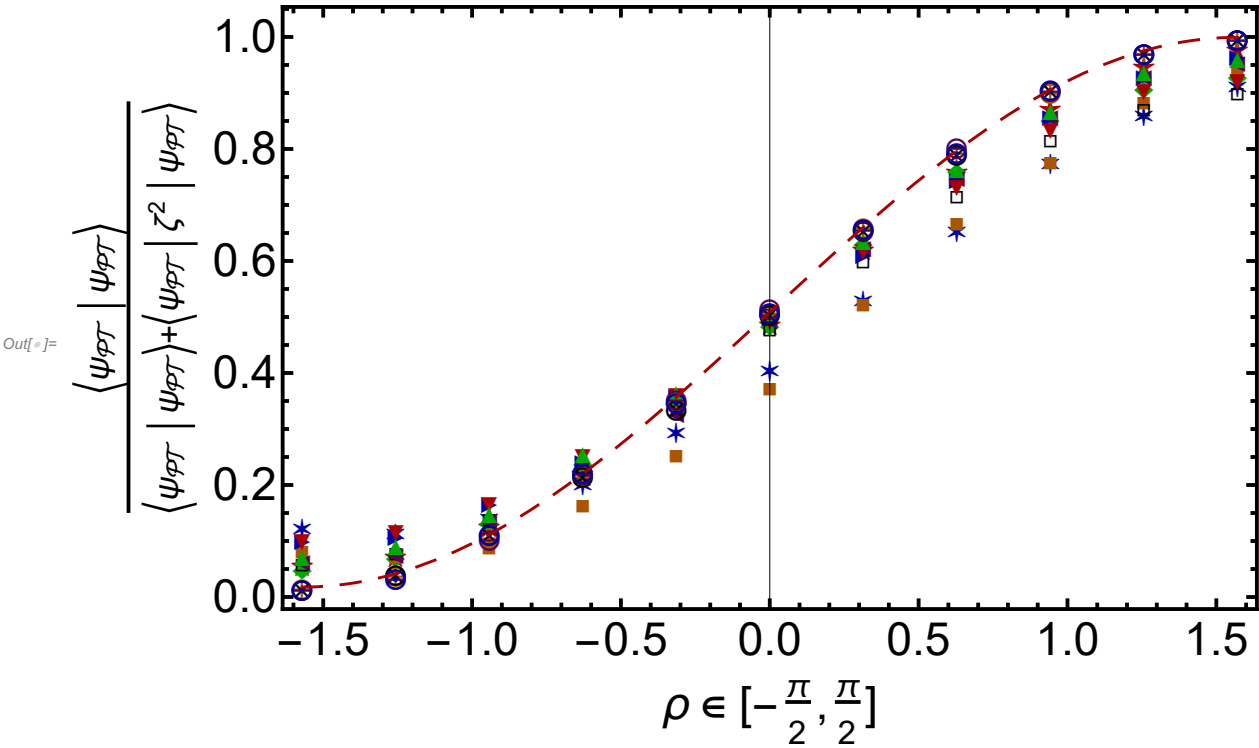


In[]:=

Out[•]=



```
In[ ]:= p2 = Show[DecisivenessExperiment, DecisivenessTheory]
```



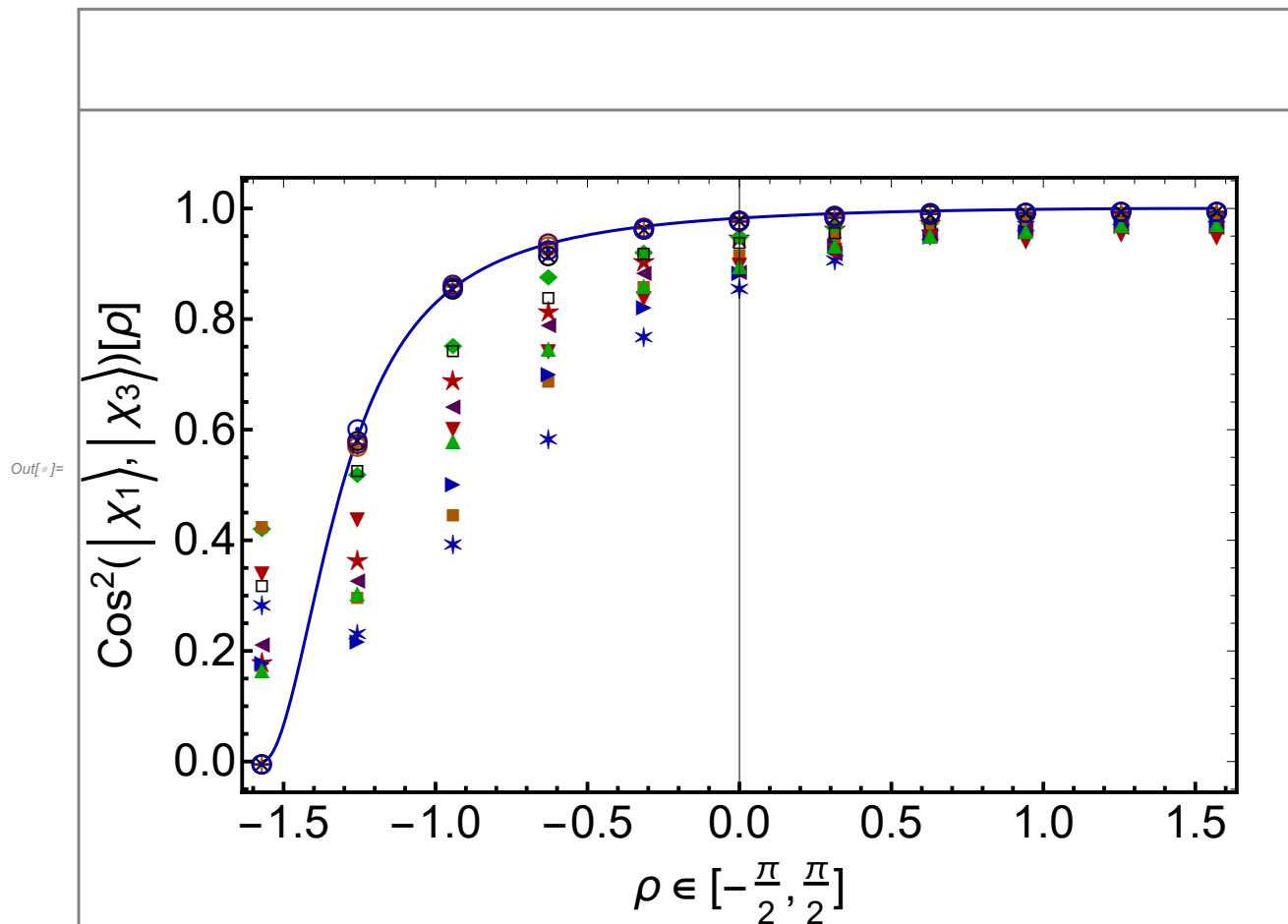
```
In[ ]:= pi/2 - 1
```

```
Out[ ]:= -1 + pi/2
```

```

In[ ]:= title = Panel[Style["Second stage,  $\alpha = \frac{\pi}{2} - 0.7$ ,  $\mathcal{N}(0) \approx \mathcal{N}_{\min}$ ", White, 20],
  ImageSize → 500, Background → Blue, Alignment → Center];
DependenceVariation = Deploy@Grid[{{title, SpanFromLeft}, {p1, p2}},
  Dividers → Gray, Spacings → {0, 0}]

```



```

In[ ]:= Export["M07Exp_8_12_2023.png", DependenceVariation, ImageSize → 10000]

```

Out[]:= M07Exp_8_12_2023.png

```

In[ ]:= (*ibm_perth*)
ZeroZeroFirst10ibmperth = 7360
ZeroOneFirst10ibmperth = 316
OneZeroFirst10ibmperth = 108
OneOneFirst10ibmperth = 408

```

```

ZeroZeroFirst08ibmperth = 6909
ZeroOneFirst08ibmperth = 328
OneZeroFirst08ibmperth = 137
OneOneFirst08ibmperth = 818

```

```

ZeroZeroFirst06ibmperth = 6158
ZeroOneFirst06ibmperth = 379

```

OneZeroFirst06ibmperth = 193
 OneOneFirst06ibmperth = 1462

ZeroZeroFirst04ibmperth = 5089
 ZeroOneFirst04ibmperth = 427
 OneZeroFirst04ibmperth = 253
 OneOneFirst04ibmperth = 2423

ZeroZeroFirst02ibmperth = 3941
 ZeroOneFirst02ibmperth = 507
 OneZeroFirst02ibmperth = 400
 OneOneFirst02ibmperth = 3344

ZeroZeroFirst00ibmperth = 2837
 ZeroOneFirst00ibmperth = 576
 OneZeroFirst00ibmperth = 480
 OneOneFirst00ibmperth = 4299

ZeroZeroSecond02ibmperth = 1850
 ZeroOneSecond02ibmperth = 573
 OneZeroSecond02ibmperth = 559
 OneOneSecond02ibmperth = 5210

ZeroZeroSecond04ibmperth = 960
 ZeroOneSecond04ibmperth = 531
 OneZeroSecond04ibmperth = 686
 OneOneSecond04ibmperth = 6015

ZeroZeroSecond06ibmperth = 453
 ZeroOneSecond06ibmperth = 423
 OneZeroSecond06ibmperth = 700
 OneOneSecond06ibmperth = 6616

ZeroZeroSecond08ibmperth = 217
 ZeroOneSecond08ibmperth = 377
 OneZeroSecond08ibmperth = 719
 OneOneSecond08ibmperth = 6879

ZeroZeroSecond10ibmperth = 284
 ZeroOneSecond10ibmperth = 316
 OneZeroSecond10ibmperth = 719
 OneOneSecond10ibmperth = 6873

CosSqibmperth =

$\left\{ \left\{ -\frac{\pi}{2} * 1, \text{ZeroZeroSecond10ibmperth} / (\text{OneZeroSecond10ibmperth} + \text{ZeroZeroSecond10ibmperth}) \right\}, \right.$
 $\left. \left\{ -\frac{\pi}{2} * 0.8, \text{ZeroZeroSecond08ibmperth} / \right. \right.$
 $\left. (\text{OneZeroSecond08ibmperth} + \text{ZeroZeroSecond08ibmperth}) \right\}, \left\{ -\frac{\pi}{2} * 0.6, \right.$
 $\left. \text{ZeroZeroSecond06ibmperth} / (\text{OneZeroSecond06ibmperth} + \text{ZeroZeroSecond06ibmperth}) \right\},$

```


$$\left\{ -\frac{\pi}{2} * 0.4, \text{ZeroZeroSecond04ibmperth} / \right.$$


$$\left. (\text{OneZeroSecond04ibmperth} + \text{ZeroZeroSecond04ibmperth}) \right\}, \left\{ -\frac{\pi}{2} * 0.2, \right.$$


$$\left. \text{ZeroZeroSecond02ibmperth} / (\text{OneZeroSecond02ibmperth} + \text{ZeroZeroSecond02ibmperth}) \right\},$$


$$\left\{ \frac{\pi}{2} * 0.0, \text{ZeroZeroFirst00ibmperth} / (\text{OneZeroFirst00ibmperth} + \text{ZeroZeroFirst00ibmperth}) \right\},$$


$$\left\{ \frac{\pi}{2} * 0.2, \text{ZeroZeroFirst02ibmperth} / (\text{OneZeroFirst02ibmperth} + \text{ZeroZeroFirst02ibmperth}) \right\},$$


$$\left\{ \frac{\pi}{2} * 0.4, \text{ZeroZeroFirst04ibmperth} / (\text{OneZeroFirst04ibmperth} + \text{ZeroZeroFirst04ibmperth}) \right\},$$


$$\left\{ \frac{\pi}{2} * 0.6, \text{ZeroZeroFirst06ibmperth} / (\text{OneZeroFirst06ibmperth} + \text{ZeroZeroFirst06ibmperth}) \right\},$$


$$\left\{ \frac{\pi}{2} * 0.8, \text{ZeroZeroFirst08ibmperth} / (\text{OneZeroFirst08ibmperth} + \text{ZeroZeroFirst08ibmperth}) \right\},$$


$$\left\{ \frac{\pi}{2} * 1, \text{ZeroZeroFirst10ibmperth} / (\text{OneZeroFirst10ibmperth} + \text{ZeroZeroFirst10ibmperth}) \right\}$$

Decisivenessibmperth =

$$\left\{ \left\{ -\frac{\pi}{2} * 1, (\text{OneZeroSecond10ibmperth} + \text{ZeroZeroSecond10ibmperth}) / 8192 \right\}, \right.$$


$$\left\{ -\frac{\pi}{2} * 0.8, (\text{OneZeroSecond08ibmperth} + \text{ZeroZeroSecond08ibmperth}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.6, (\text{OneZeroSecond06ibmperth} + \text{ZeroZeroSecond06ibmperth}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.4, (\text{OneZeroSecond04ibmperth} + \text{ZeroZeroSecond04ibmperth}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.2, (\text{OneZeroSecond02ibmperth} + \text{ZeroZeroSecond02ibmperth}) / 8192 \right\},$$


$$\left\{ -\frac{\pi}{2} * 0.0, (\text{OneZeroFirst00ibmperth} + \text{ZeroZeroFirst00ibmperth}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 0.2, (\text{OneZeroFirst02ibmperth} + \text{ZeroZeroFirst02ibmperth}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 0.4, (\text{OneZeroFirst04ibmperth} + \text{ZeroZeroFirst04ibmperth}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 0.6, (\text{OneZeroFirst06ibmperth} + \text{ZeroZeroFirst06ibmperth}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 0.8, (\text{OneZeroFirst08ibmperth} + \text{ZeroZeroFirst08ibmperth}) / 8192 \right\},$$


$$\left\{ \frac{\pi}{2} * 1.0, (\text{OneZeroFirst10ibmperth} + \text{ZeroZeroFirst10ibmperth}) / 8192 \right\}$$

ExpCosSqibmperth = ListPlot[CosSqibmperth]
ExpDecisivenessibmperth = ListPlot[Decisivenessibmperth]
Show[costH, ExpCosSqibmperth]
Show[decTH, ExpDecisivenessibmperth]

```

Out[]= 7360

Out[]= 316

Out[]= 108

Out[]= 408

Out[]= 6909

Out[]= 328

Out[]= 137

Out[]= 818

Out[]= 6158

Out[]= 379

Out[]= 193

Out[]= 1462

Out[]= 5089

Out[]= 427

Out[]= 253

Out[]= 2423

Out[]= 3941

Out[]= 507

Out[]= 400

Out[]= 3344

Out[]= 2837

Out[]= 576

Out[]= 480

Out[]= 4299

Out[]= 1850

Out[]= 573

Out[]= 559

Out[]= 5210

Out[]= 960

Out[]= 531

Out[]= 686

Out[]= 6015

Out[]= 453

Out[]= 423

Out[]= 700

Out[]= 6616

Out[]= 217

Out[]= 377

Out[]= 719

Out[]= 6879

Out[]= 284

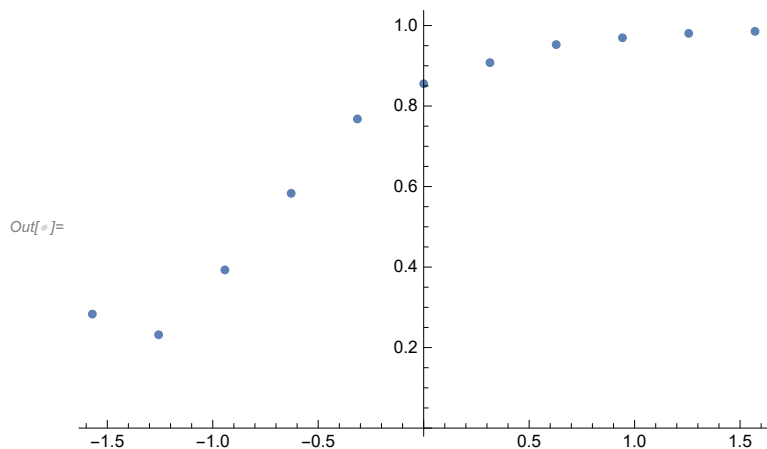
Out[]= 316

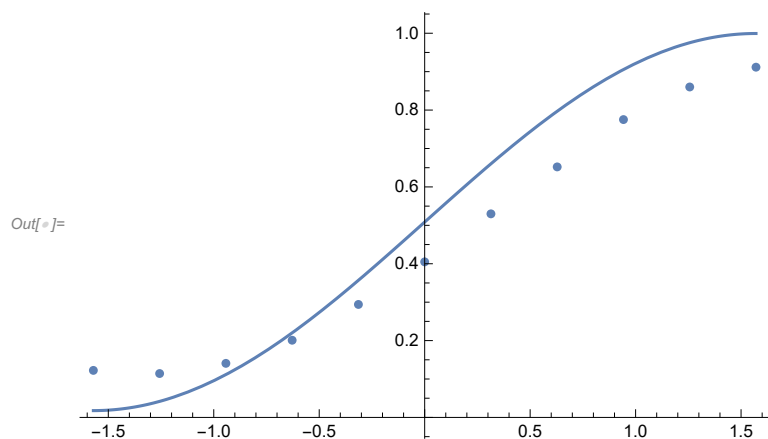
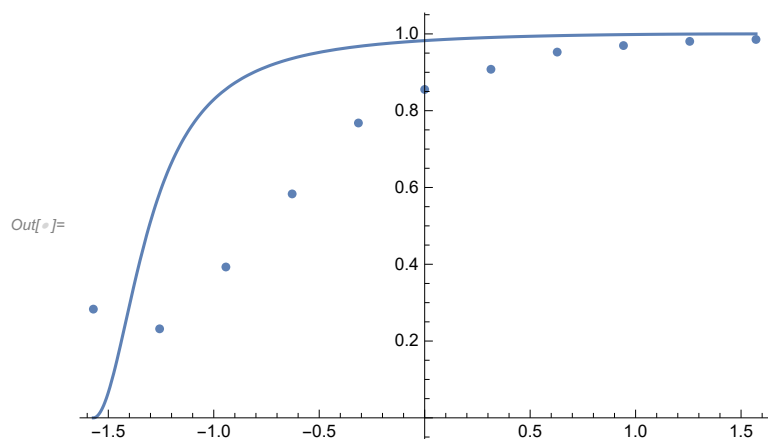
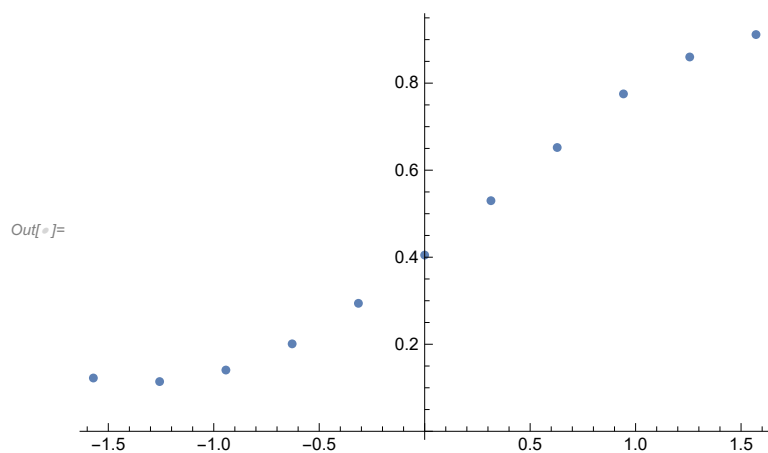
Out[]= 719

Out[]= 6873

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{284}{1003} \right\}, \left\{ -1.25664, \frac{217}{936} \right\}, \left\{ -0.942478, \frac{453}{1153} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{480}{823} \right\}, \left\{ -0.314159, \frac{1850}{2409} \right\}, \left\{ 0., \frac{2837}{3317} \right\}, \left\{ 0.314159, \frac{3941}{4341} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{5089}{5342} \right\}, \left\{ 0.942478, \frac{6158}{6351} \right\}, \left\{ 1.25664, \frac{6909}{7046} \right\}, \left\{ \frac{\pi}{2}, \frac{1840}{1867} \right\} \right\}$

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{1003}{8192} \right\}, \left\{ -1.25664, \frac{117}{1024} \right\}, \left\{ -0.942478, \frac{1153}{8192} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{823}{4096} \right\}, \left\{ -0.314159, \frac{2409}{8192} \right\}, \left\{ 0., \frac{3317}{8192} \right\}, \left\{ 0.314159, \frac{4341}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{2671}{4096} \right\}, \left\{ 0.942478, \frac{6351}{8192} \right\}, \left\{ 1.25664, \frac{3523}{4096} \right\}, \left\{ 1.5708, \frac{1867}{2048} \right\} \right\}$





In[]:= (*ibmq_jakarta*)

ZeroZeroFirst10ibmqjakarta = 7939

ZeroOneFirst10ibmqjakarta = 105

OneZeroFirst10ibmqjakarta = 69

OneOneFirst10ibmqjakarta = 79

ZeroZeroFirst08ibmqjakarta = 7694

ZeroOneFirst08ibmqjakarta = 97

OneZeroFirst08ibmqjakarta = 74

OneOneFirst08ibmqjakarta = 327

ZeroZeroFirst06ibmqjakarta = 7044
 ZeroOneFirst06ibmqjakarta = 140
 OneZeroFirst06ibmqjakarta = 101
 OneOneFirst06ibmqjakarta = 907

ZeroZeroFirst04ibmqjakarta = 6077
 ZeroOneFirst04ibmqjakarta = 163
 OneZeroFirst04ibmqjakarta = 156
 OneOneFirst04ibmqjakarta = 1796

ZeroZeroFirst02ibmqjakarta = 4909
 ZeroOneFirst02ibmqjakarta = 206
 OneZeroFirst02ibmqjakarta = 183
 OneOneFirst02ibmqjakarta = 2894

ZeroZeroFirst00ibmqjakarta = 3781
 ZeroOneFirst00ibmqjakarta = 253
 OneZeroFirst00ibmqjakarta = 205
 OneOneFirst00ibmqjakarta = 3953

ZeroZeroSecond02ibmqjakarta = 2532
 ZeroOneSecond02ibmqjakarta = 271
 OneZeroSecond02ibmqjakarta = 263
 OneOneSecond02ibmqjakarta = 5126

ZeroZeroSecond04ibmqjakarta = 1478
 ZeroOneSecond04ibmqjakarta = 298
 OneZeroSecond04ibmqjakarta = 338
 OneOneSecond04ibmqjakarta = 6078

ZeroZeroSecond06ibmqjakarta = 713
 ZeroOneSecond06ibmqjakarta = 301
 OneZeroSecond06ibmqjakarta = 319
 OneOneSecond06ibmqjakarta = 6859

ZeroZeroSecond08ibmqjakarta = 219
 ZeroOneSecond08ibmqjakarta = 293
 OneZeroSecond08ibmqjakarta = 381
 OneOneSecond08ibmqjakarta = 7299

ZeroZeroSecond10ibmqjakarta = 84
 ZeroOneSecond10ibmqjakarta = 281
 OneZeroSecond10ibmqjakarta = 380
 OneOneSecond10ibmqjakarta = 7447

$\text{CosSqibmqjakarta} = \left\{ \left\{ -\frac{\pi}{2} * 1, \text{ZeroZeroSecond10ibmqjakarta} / \right. \right.$
 $\left. \left(\text{OneZeroSecond10ibmqjakarta} + \text{ZeroZeroSecond10ibmqjakarta} \right) \right\},$
 $\left\{ -\frac{\pi}{2} * 0.8, \text{ZeroZeroSecond08ibmqjakarta} / \right.$

```

    (OneZeroSecond08ibmqjakarta + ZeroZeroSecond08ibmqjakarta) }},
    { -  $\frac{\pi}{2} * 0.6$ , ZeroZeroSecond06ibmqjakarta /
      (OneZeroSecond06ibmqjakarta + ZeroZeroSecond06ibmqjakarta) },
    { -  $\frac{\pi}{2} * 0.4$ , ZeroZeroSecond04ibmqjakarta /
      (OneZeroSecond04ibmqjakarta + ZeroZeroSecond04ibmqjakarta) },
    { -  $\frac{\pi}{2} * 0.2$ , ZeroZeroSecond02ibmqjakarta /
      (OneZeroSecond02ibmqjakarta + ZeroZeroSecond02ibmqjakarta) }, {  $\frac{\pi}{2} * 0.0$ ,
      ZeroZeroFirst00ibmqjakarta / (OneZeroFirst00ibmqjakarta + ZeroZeroFirst00ibmqjakarta) },
    {  $\frac{\pi}{2} * 0.2$ , ZeroZeroFirst02ibmqjakarta /
      (OneZeroFirst02ibmqjakarta + ZeroZeroFirst02ibmqjakarta) }, {  $\frac{\pi}{2} * 0.4$ ,
      ZeroZeroFirst04ibmqjakarta / (OneZeroFirst04ibmqjakarta + ZeroZeroFirst04ibmqjakarta) },
    {  $\frac{\pi}{2} * 0.6$ , ZeroZeroFirst06ibmqjakarta /
      (OneZeroFirst06ibmqjakarta + ZeroZeroFirst06ibmqjakarta) }, {  $\frac{\pi}{2} * 0.8$ ,
      ZeroZeroFirst08ibmqjakarta / (OneZeroFirst08ibmqjakarta + ZeroZeroFirst08ibmqjakarta) },
    {  $\frac{\pi}{2} * 1$ , ZeroZeroFirst10ibmqjakarta /
      (OneZeroFirst10ibmqjakarta + ZeroZeroFirst10ibmqjakarta) } }
Decisivenessibmqjakarta = { { -  $\frac{\pi}{2} * 1$ ,
    (OneZeroSecond10ibmqjakarta + ZeroZeroSecond10ibmqjakarta) / 8192 },
    { -  $\frac{\pi}{2} * 0.8$ , (OneZeroSecond08ibmqjakarta + ZeroZeroSecond08ibmqjakarta) / 8192 },
    { -  $\frac{\pi}{2} * 0.6$ , (OneZeroSecond06ibmqjakarta + ZeroZeroSecond06ibmqjakarta) / 8192 },
    { -  $\frac{\pi}{2} * 0.4$ , (OneZeroSecond04ibmqjakarta + ZeroZeroSecond04ibmqjakarta) / 8192 },
    { -  $\frac{\pi}{2} * 0.2$ , (OneZeroSecond02ibmqjakarta + ZeroZeroSecond02ibmqjakarta) / 8192 },
    { -  $\frac{\pi}{2} * 0.0$ , (OneZeroFirst00ibmqjakarta + ZeroZeroFirst00ibmqjakarta) / 8192 },
    {  $\frac{\pi}{2} * 0.2$ , (OneZeroFirst02ibmqjakarta + ZeroZeroFirst02ibmqjakarta) / 8192 },
    {  $\frac{\pi}{2} * 0.4$ , (OneZeroFirst04ibmqjakarta + ZeroZeroFirst04ibmqjakarta) / 8192 },
    {  $\frac{\pi}{2} * 0.6$ , (OneZeroFirst06ibmqjakarta + ZeroZeroFirst06ibmqjakarta) / 8192 },
    {  $\frac{\pi}{2} * 0.8$ , (OneZeroFirst08ibmqjakarta + ZeroZeroFirst08ibmqjakarta) / 8192 },
    {  $\frac{\pi}{2} * 1.0$ , (OneZeroFirst10ibmqjakarta + ZeroZeroFirst10ibmqjakarta) / 8192 } }
ExpCosSqibmqjakarta = ListPlot[CosSqibmqjakarta]
ExpDecisivenessibmqjakarta = ListPlot[Decisivenessibmqjakarta]
Show[cosTH, ExpCosSqibmqjakarta]

```

Show[decTH, ExpDecisivenessibmqjakarta]

(*ibm_lagos*)

ZeroZeroFirst10ibmlagos = 7565

ZeroOneFirst10ibmlagos = 351

OneZeroFirst10ibmlagos = 71

OneOneFirst10ibmlagos = 205

ZeroZeroFirst08ibmlagos = 7360

ZeroOneFirst08ibmlagos = 322

OneZeroFirst08ibmlagos = 98

OneOneFirst08ibmlagos = 412

ZeroZeroFirst06ibmlagos = 6905

ZeroOneFirst06ibmlagos = 254

OneZeroFirst06ibmlagos = 93

OneOneFirst06ibmlagos = 940

ZeroZeroFirst04ibmlagos = 6116

ZeroOneFirst04ibmlagos = 205

OneZeroFirst04ibmlagos = 135

OneOneFirst04ibmlagos = 1736

ZeroZeroFirst02ibmlagos = 5035

ZeroOneFirst02ibmlagos = 193

OneZeroFirst02ibmlagos = 150

OneOneFirst02ibmlagos = 2814

ZeroZeroFirst00ibmlagos = 3798

ZeroOneFirst00ibmlagos = 194

OneZeroFirst00ibmlagos = 184

OneOneFirst00ibmlagos = 4016

ZeroZeroSecond02ibmlagos = 2674

ZeroOneSecond02ibmlagos = 152

OneZeroSecond02ibmlagos = 216

OneOneSecond02ibmlagos = 5150

ZeroZeroSecond04ibmlagos = 1732

ZeroOneSecond04ibmlagos = 157

OneZeroSecond04ibmlagos = 234

OneOneSecond04ibmlagos = 6069

ZeroZeroSecond06ibmlagos = 836

ZeroOneSecond06ibmlagos = 146

OneZeroSecond06ibmlagos = 270

OneOneSecond06ibmlagos = 6940

ZeroZeroSecond08ibmlagos = 309

ZeroOneSecond08ibmlagos = 125

OneZeroSecond08ibmlagos = 282

OneOneSecond08ibmlagos = 7476

ZeroZeroSecond10ibmlagos = 176

ZeroOneSecond10ibmlagos = 149

OneZeroSecond10ibmlagos = 237

OneOneSecond10ibmlagos = 7630

CosSqibmlagos =

$$\left\{ \left\{ -\frac{\pi}{2} * 1, \text{ZeroZeroSecond10ibmlagos} / (\text{OneZeroSecond10ibmlagos} + \text{ZeroZeroSecond10ibmlagos}) \right\}, \right. \\ \left\{ -\frac{\pi}{2} * 0.8, \text{ZeroZeroSecond08ibmlagos} / \right. \\ \left. (\text{OneZeroSecond08ibmlagos} + \text{ZeroZeroSecond08ibmlagos}) \right\}, \left\{ -\frac{\pi}{2} * 0.6, \right. \\ \left. \text{ZeroZeroSecond06ibmlagos} / (\text{OneZeroSecond06ibmlagos} + \text{ZeroZeroSecond06ibmlagos}) \right\}, \\ \left\{ -\frac{\pi}{2} * 0.4, \text{ZeroZeroSecond04ibmlagos} / \right. \\ \left. (\text{OneZeroSecond04ibmlagos} + \text{ZeroZeroSecond04ibmlagos}) \right\}, \left\{ -\frac{\pi}{2} * 0.2, \right. \\ \left. \text{ZeroZeroSecond02ibmlagos} / (\text{OneZeroSecond02ibmlagos} + \text{ZeroZeroSecond02ibmlagos}) \right\}, \\ \left\{ \frac{\pi}{2} * 0.0, \text{ZeroZeroFirst00ibmlagos} / (\text{OneZeroFirst00ibmlagos} + \text{ZeroZeroFirst00ibmlagos}) \right\}, \\ \left\{ \frac{\pi}{2} * 0.2, \text{ZeroZeroFirst02ibmlagos} / (\text{OneZeroFirst02ibmlagos} + \text{ZeroZeroFirst02ibmlagos}) \right\}, \\ \left\{ \frac{\pi}{2} * 0.4, \text{ZeroZeroFirst04ibmlagos} / (\text{OneZeroFirst04ibmlagos} + \text{ZeroZeroFirst04ibmlagos}) \right\}, \\ \left\{ \frac{\pi}{2} * 0.6, \text{ZeroZeroFirst06ibmlagos} / (\text{OneZeroFirst06ibmlagos} + \text{ZeroZeroFirst06ibmlagos}) \right\}, \\ \left\{ \frac{\pi}{2} * 0.8, \text{ZeroZeroFirst08ibmlagos} / (\text{OneZeroFirst08ibmlagos} + \text{ZeroZeroFirst08ibmlagos}) \right\}, \\ \left. \left. \left\{ \frac{\pi}{2} * 1, \text{ZeroZeroFirst10ibmlagos} / (\text{OneZeroFirst10ibmlagos} + \text{ZeroZeroFirst10ibmlagos}) \right\} \right\} \right\}$$

Decisivenessibmlagos =

$$\left\{ \left\{ -\frac{\pi}{2} * 1, (\text{OneZeroSecond10ibmlagos} + \text{ZeroZeroSecond10ibmlagos}) / 8192 \right\}, \right. \\ \left\{ -\frac{\pi}{2} * 0.8, (\text{OneZeroSecond08ibmlagos} + \text{ZeroZeroSecond08ibmlagos}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.6, (\text{OneZeroSecond06ibmlagos} + \text{ZeroZeroSecond06ibmlagos}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.4, (\text{OneZeroSecond04ibmlagos} + \text{ZeroZeroSecond04ibmlagos}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.2, (\text{OneZeroSecond02ibmlagos} + \text{ZeroZeroSecond02ibmlagos}) / 8192 \right\}, \\ \left\{ -\frac{\pi}{2} * 0.0, (\text{OneZeroFirst00ibmlagos} + \text{ZeroZeroFirst00ibmlagos}) / 8192 \right\}, \\ \left\{ \frac{\pi}{2} * 0.2, (\text{OneZeroFirst02ibmlagos} + \text{ZeroZeroFirst02ibmlagos}) / 8192 \right\}, \\ \left\{ \frac{\pi}{2} * 0.4, (\text{OneZeroFirst04ibmlagos} + \text{ZeroZeroFirst04ibmlagos}) / 8192 \right\}, \\ \left. \left. \left\{ \frac{\pi}{2} * 0.6, (\text{OneZeroFirst06ibmlagos} + \text{ZeroZeroFirst06ibmlagos}) / 8192 \right\}, \right. \right. \\ \left. \left. \left\{ \frac{\pi}{2} * 0.8, (\text{OneZeroFirst08ibmlagos} + \text{ZeroZeroFirst08ibmlagos}) / 8192 \right\}, \right. \right. \\ \left. \left. \left\{ \frac{\pi}{2} * 1, (\text{OneZeroFirst10ibmlagos} + \text{ZeroZeroFirst10ibmlagos}) / 8192 \right\} \right\} \right\}$$

$$\left\{ \frac{\pi}{2} * 0.8, (OneZeroFirst08ibmlagos + ZeroZeroFirst08ibmlagos) / 8192 \right\},$$

$$\left\{ \frac{\pi}{2} * 1.0, (OneZeroFirst10ibmlagos + ZeroZeroFirst10ibmlagos) / 8192 \right\}$$

ExpCosSqibmlagos = ListPlot[CosSqibmlagos]

ExpDecisivenessibmlagos = ListPlot[Decisivenessibmlagos]

Show[cosTH, ExpCosSqibmlagos, PlotRange → All]

Show[decTH, ExpDecisivenessibmlagos]

Out[]= 7939

Out[]= 105

Out[]= 69

Out[]= 79

Out[]= 7694

Out[]= 97

Out[]= 74

Out[]= 327

Out[]= 7044

Out[]= 140

Out[]= 101

Out[]= 907

Out[]= 6077

Out[]= 163

Out[]= 156

Out[]= 1796

Out[]= 4909

Out[]= 206

Out[]= 183

Out[]= 2894

Out[]= 3781

Out[]= 253

Out[]= 205

Out[]= 3953

Out[]= 2532

Out[]= 271

Out[]= 263

Out[]= 5126

Out[]= 1478

Out[]= 298

Out[]= 338

Out[]= 6078

Out[]= 713

Out[]= 301

Out[]= 319

Out[]= 6859

Out[]= 219

Out[]= 293

Out[]= 381

Out[]= 7299

Out[]= 84

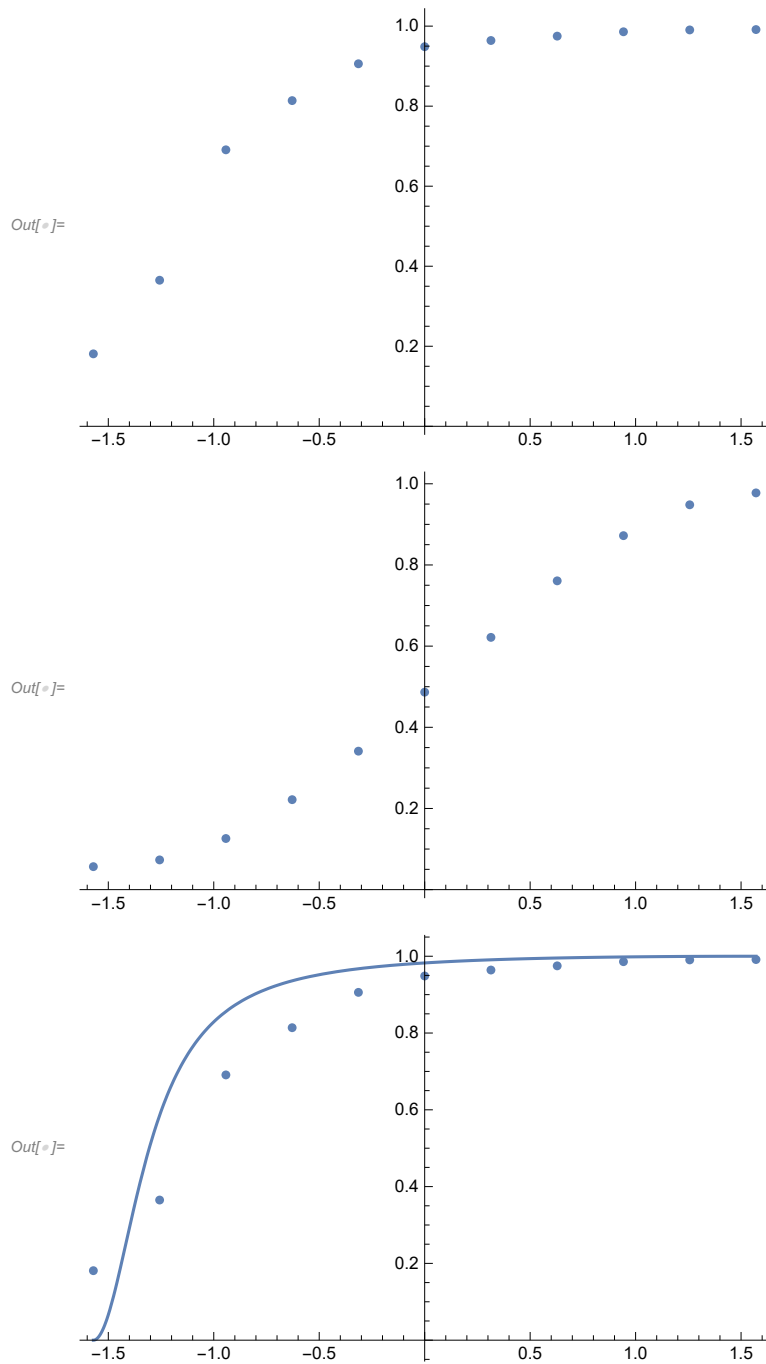
Out[]= 281

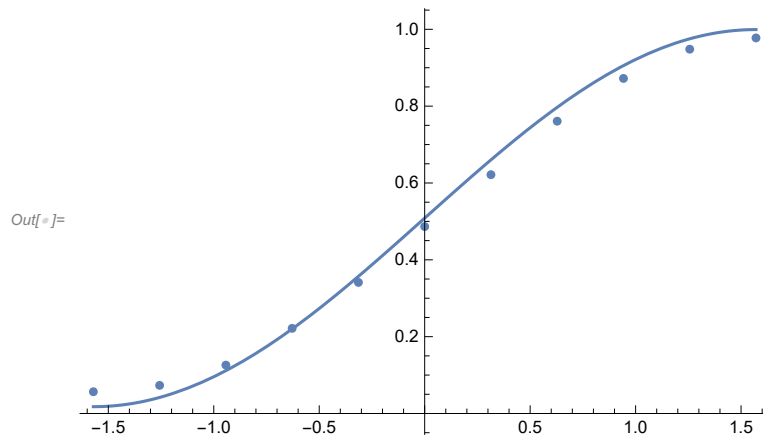
Out[]= 380

Out[]= 7447

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{21}{116} \right\}, \left\{ -1.25664, \frac{73}{200} \right\}, \left\{ -0.942478, \frac{713}{1032} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{739}{908} \right\}, \left\{ -0.314159, \frac{2532}{2795} \right\}, \left\{ 0., \frac{3781}{3986} \right\}, \left\{ 0.314159, \frac{4909}{5092} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6077}{6233} \right\}, \left\{ 0.942478, \frac{7044}{7145} \right\}, \left\{ 1.25664, \frac{3847}{3884} \right\}, \left\{ \frac{\pi}{2}, \frac{7939}{8008} \right\} \right\}$

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{29}{512} \right\}, \left\{ -1.25664, \frac{75}{1024} \right\}, \left\{ -0.942478, \frac{129}{1024} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{227}{1024} \right\}, \left\{ -0.314159, \frac{2795}{8192} \right\}, \left\{ 0., \frac{1993}{4096} \right\}, \left\{ 0.314159, \frac{1273}{2048} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6233}{8192} \right\}, \left\{ 0.942478, \frac{7145}{8192} \right\}, \left\{ 1.25664, \frac{971}{1024} \right\}, \left\{ 1.5708, \frac{1001}{1024} \right\} \right\}$





Out[]= 7565

Out[]= 351

Out[]= 71

Out[]= 205

Out[]= 7360

Out[]= 322

Out[]= 98

Out[]= 412

Out[]= 6905

Out[]= 254

Out[]= 93

Out[]= 940

Out[]= 6116

Out[]= 205

Out[]= 135

Out[]= 1736

Out[]= 5035

Out[]= 193

Out[]= 150

Out[]= 2814

Out[]= 3798

Out[]= 194

Out[]= 184

Out[]= 4016

Out[]= 2674

Out[]= 152

Out[]= 216

Out[]= 5150

Out[]= 1732

Out[]= 157

Out[]= 234

Out[]= 6069

Out[]= 836

Out[]= 146

Out[]= 270

Out[]= 6940

Out[]= 309

Out[]= 125

Out[]= 282

Out[]= 7476

Out[]= 176

Out[]= 149

Out[]= 237

Out[]= 7630

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{176}{413} \right\}, \left\{ -1.25664, \frac{103}{197} \right\}, \left\{ -0.942478, \frac{418}{553} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{866}{983} \right\}, \left\{ -0.314159, \frac{1337}{1445} \right\}, \left\{ 0., \frac{1899}{1991} \right\}, \left\{ 0.314159, \frac{1007}{1037} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6116}{6251} \right\}, \left\{ 0.942478, \frac{6905}{6998} \right\}, \left\{ 1.25664, \frac{3680}{3729} \right\}, \left\{ \frac{\pi}{2}, \frac{7565}{7636} \right\} \right\}$

Out[]= $\left\{ \left\{ -\frac{\pi}{2}, \frac{413}{8192} \right\}, \left\{ -1.25664, \frac{591}{8192} \right\}, \left\{ -0.942478, \frac{553}{4096} \right\}, \right.$
 $\left. \left\{ -0.628319, \frac{983}{4096} \right\}, \left\{ -0.314159, \frac{1445}{4096} \right\}, \left\{ 0., \frac{1991}{4096} \right\}, \left\{ 0.314159, \frac{5185}{8192} \right\}, \right.$
 $\left. \left\{ 0.628319, \frac{6251}{8192} \right\}, \left\{ 0.942478, \frac{3499}{4096} \right\}, \left\{ 1.25664, \frac{3729}{4096} \right\}, \left\{ 1.5708, \frac{1909}{2048} \right\} \right\}$

