In[ ]:= **(*simulator_extended_stabilizer*)**
ZeroZeroFirst10simulatorextendedstabilizer = 8188
ZeroOneFirst10simulatorextendedstabilizer = 4
OneZeroFirst10simulatorextendedstabilizer = 0
OneOneFirst10simulatorextendedstabilizer = 0

ZeroZeroFirst08simulatorextendedstabilizer = 7963
ZeroOneFirst08simulatorextendedstabilizer = 5
OneZeroFirst08simulatorextendedstabilizer = 1
OneOneFirst08simulatorextendedstabilizer = 223

ZeroZeroFirst06simulatorextendedstabilizer = 7355
ZeroOneFirst06simulatorextendedstabilizer = 3
OneZeroFirst06simulatorextendedstabilizer = 3
OneOneFirst06simulatorextendedstabilizer = 831

ZeroZeroFirst04simulatorextendedstabilizer = 6504
ZeroOneFirst04simulatorextendedstabilizer = 2
OneZeroFirst04simulatorextendedstabilizer = 5
OneOneFirst04simulatorextendedstabilizer = 1681

ZeroZeroFirst02simulatorextendedstabilizer = 5305
ZeroOneFirst02simulatorextendedstabilizer = 3
OneZeroFirst02simulatorextendedstabilizer = 15
OneOneFirst02simulatorextendedstabilizer = 2869

ZeroZeroFirst00simulatorextendedstabilizer = 4124
ZeroOneFirst00simulatorextendedstabilizer = 3
OneZeroFirst00simulatorextendedstabilizer = 12
OneOneFirst00simulatorextendedstabilizer = 4053

ZeroZeroSecond02simulatorextendedstabilizer = 2871
ZeroOneSecond02simulatorextendedstabilizer = 1
OneZeroSecond02simulatorextendedstabilizer = 24
OneOneSecond02simulatorextendedstabilizer = 5296

ZeroZeroSecond04simulatorextendedstabilizer = 1725
ZeroOneSecond04simulatorextendedstabilizer = 2
OneZeroSecond04simulatorextendedstabilizer = 27
OneOneSecond04simulatorextendedstabilizer = 6438

ZeroZeroSecond06simulatorextendedstabilizer = 801
ZeroOneSecond06simulatorextendedstabilizer = 0
OneZeroSecond06simulatorextendedstabilizer = 23
OneOneSecond06simulatorextendedstabilizer = 7368

ZeroZeroSecond08simulatorextendedstabilizer = 189
ZeroOneSecond08simulatorextendedstabilizer = 1
OneZeroSecond08simulatorextendedstabilizer = 49
OneOneSecond08simulatorextendedstabilizer = 7953

```
ZeroZeroSecond10simulatorextendedstabilizer = 0
ZeroOneSecond10simulatorextendedstabilizer = 0
OneZeroSecond10simulatorextendedstabilizer = 40
OneOneSecond10simulatorextendedstabilizer = 8152

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[ ]= 8188

Out[ ]= 4

Out[ ]= 0

Out[ ]= 0

Out[ ]= 7963

Out[ ]= 5

Out[ ]= 1

Out[ ]= 223

Out[ ]= 7355

Out[ ]= 3

Out[ ]= 3

Out[ ]= 831

Out[ ]= 6504

Out[ ]= 2

Out[ ]= 5

Out[ ]= 1681

Out[ ]= 5305

Out[ ]= 3

Out[ ]= 15

Out[●]= 2869

Out[●]= 4124

Out[●]= 3

Out[●]= 12

Out[●]= 4053

Out[●]= 2871

Out[●]= 1

Out[●]= 24

Out[●]= 5296

Out[●]= 1725

Out[●]= 2

Out[●]= 27

Out[●]= 6438

Out[●]= 801

Out[●]= 0

Out[●]= 23

Out[●]= 7368

Out[●]= 189

Out[●]= 1

Out[●]= 49

Out[●]= 7953

Out[●]= 0

Out[●]= 0

Out[●]= 40

Out[●]= 8152

Out[●]= $\left\{\left\{-\frac{\pi}{2}, 0\right\}, \left\{-1.25664, \frac{27}{34}\right\}, \left\{-0.942478, \frac{801}{824}\right\},\right.$
$\left\{-0.628319, \frac{575}{584}\right\}, \left\{-0.314159, \frac{957}{965}\right\}, \left\{0., \frac{1031}{1034}\right\}, \left\{0.314159, \frac{1061}{1064}\right\},$
$\left.\left\{0.628319, \frac{6504}{6509}\right\}, \left\{0.942478, \frac{7355}{7358}\right\}, \left\{1.25664, \frac{7963}{7964}\right\}, \left\{\frac{\pi}{2}, 1\right\}\right\}$
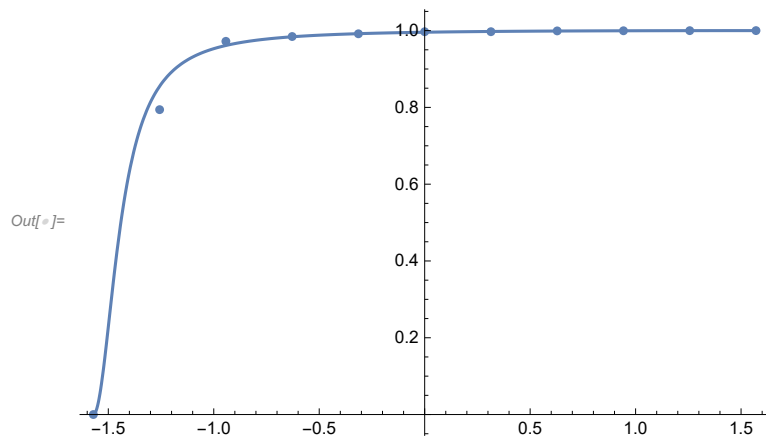
Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{5}{1024}\right\}, \left\{-1.25664, \frac{119}{4096}\right\}, \left\{-0.942478, \frac{103}{1024}\right\},\right.$

$\left\{-0.628319, \frac{219}{1024}\right\}, \left\{-0.314159, \frac{2895}{8192}\right\}, \left\{0., \frac{517}{1024}\right\}, \left\{0.314159, \frac{665}{1024}\right\},$

$\left\{0.628319, \frac{6509}{8192}\right\}, \left\{0.942478, \frac{3679}{4096}\right\}, \left\{1.25664, \frac{1991}{2048}\right\}, \left\{1.5708, \frac{2047}{2048}\right\}\right\}$
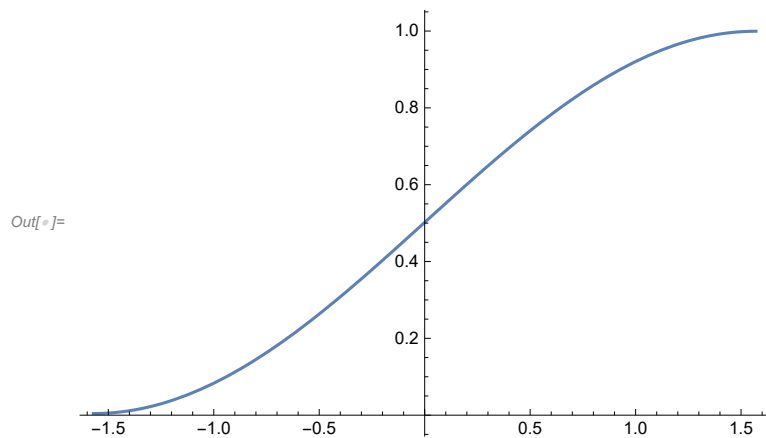
Out[ ]=

Out[ ]=
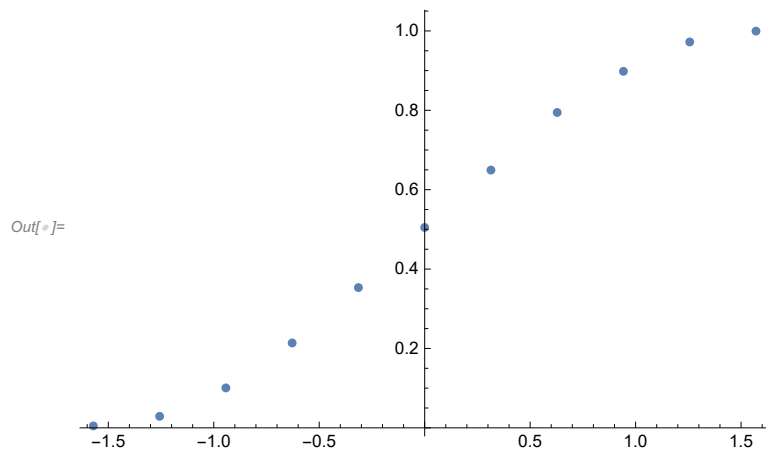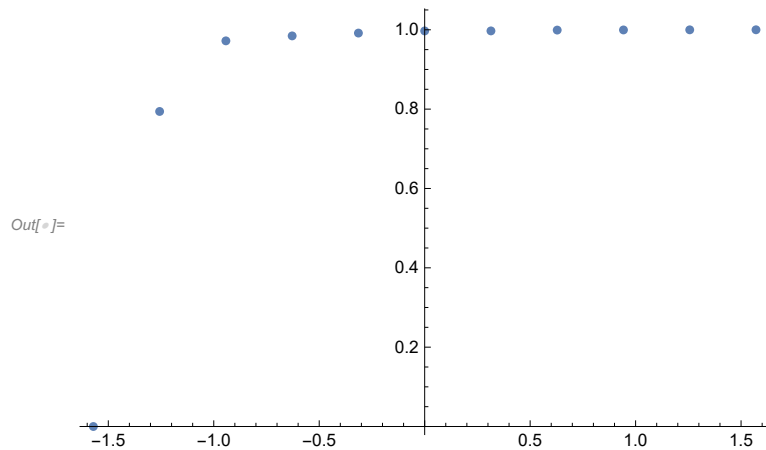
In[ ]:= **cosTH = Plot$\left[\text{cos13F}\left[\pi/2 - 0.5, \pi/2, x\right], \{x, -\pi/2, \pi/2\}, \text{PlotRange} \to \text{All}\right]$**

Out[ ]=

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

Out[ ]=
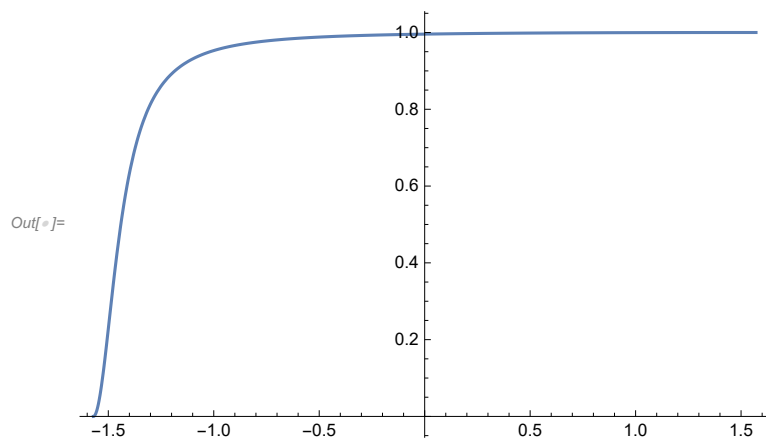
In[ ]:= **decTH = Plot$\left[\text{DecisiveProbability}\left[15.345, \pi/2 - 0.5, \pi/2, x\right], \{x, -\pi/2, \pi/2\}\right]$**

Out[ ]=

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

Out[ ]=
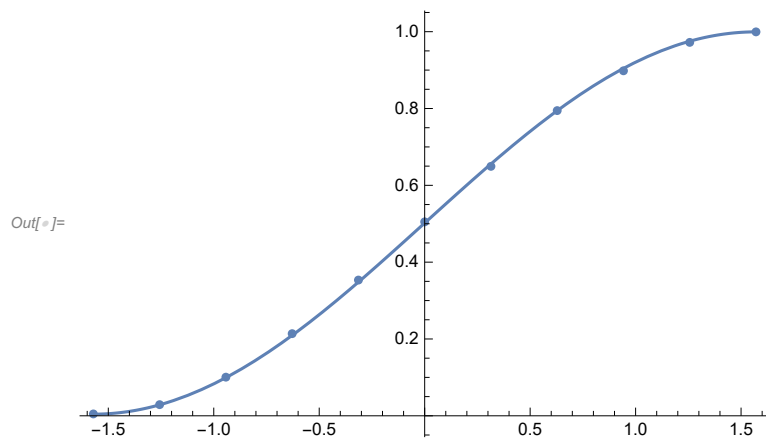
In[ ]:= **(*simulator_mps*)**
ZeroZeroFirst10simulatormps = 8190
ZeroOneFirst10simulatormps = 2
OneZeroFirst10simulatormps = 0
OneOneFirst10simulatormps = 0

```
ZeroZeroFirst08simulatormps = 7975
ZeroOneFirst08simulatormps = 2
OneZeroFirst08simulatormps = 1
OneOneFirst08simulatormps = 214


ZeroZeroFirst06simulatormps = 7412
ZeroOneFirst06simulatormps = 2
OneZeroFirst06simulatormps = 7
OneOneFirst06simulatormps = 771


ZeroZeroFirst04simulatormps = 6485
ZeroOneFirst04simulatormps = 3
OneZeroFirst04simulatormps = 7
OneOneFirst04simulatormps = 1697


ZeroZeroFirst02simulatormps = 5356
ZeroOneFirst02simulatormps = 3
OneZeroFirst02simulatormps = 6
OneOneFirst02simulatormps = 2827


ZeroZeroFirst00simulatormps = 4032
ZeroOneFirst00simulatormps = 6
OneZeroFirst00simulatormps = 16
OneOneFirst00simulatormps = 4138


ZeroZeroSecond02simulatormps = 2727
ZeroOneSecond02simulatormps = 1
OneZeroSecond02simulatormps = 25
OneOneSecond02simulatormps = 5439


ZeroZeroSecond04simulatormps = 1673
ZeroOneSecond04simulatormps = 2
OneZeroSecond04simulatormps = 32
OneOneSecond04simulatormps = 6485


ZeroZeroSecond06simulatormps = 798
ZeroOneSecond06simulatormps = 1
OneZeroSecond06simulatormps = 32
OneOneSecond06simulatormps = 7361


ZeroZeroSecond08simulatormps = 201
ZeroOneSecond08simulatormps = 0
OneZeroSecond08simulatormps = 28
OneOneSecond08simulatormps = 7963


ZeroZeroSecond10simulatormps = 0
ZeroOneSecond10simulatormps = 0
OneZeroSecond10simulatormps = 25
OneOneSecond10simulatormps = 8167
```

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

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

```
ExpCosSqsimulatormps = ListPlot[CosSqsimulatormps]
ExpDecisivenesssimulatormps = ListPlot[Decisivenesssimulatormps]
```

Out[●]= 8190

Out[●]= 2

Out[●]= 0

Out[●]= 0

Out[●]= 7975

Out[●]= 2

Out[●]= 1

Out[●]= 214

Out[●]= 7412

Out[●]= 2

Out[●]= 7

Out[●]= 771

Out[●]= 6485

Out[●]= 3

Out[●]= 7

Out[●]= 1697

Out[●]= 5356

Out[●]= 3

Out[●]= 6

Out[●]= 2827

Out[●]= 4032

Out[●]= 6

Out[●]= 16

Out[●]= 4138

Out[●]= 2727

Out[●]= 1

Out[●]= 25

Out[●]= 5439

Out[•]= 1673

Out[•]= 2

Out[•]= 32

Out[•]= 6485

Out[•]= 798

Out[•]= 1

Out[•]= 32

Out[•]= 7361

Out[•]= 201

Out[•]= 0

Out[•]= 28

Out[•]= 7963

Out[•]= 0

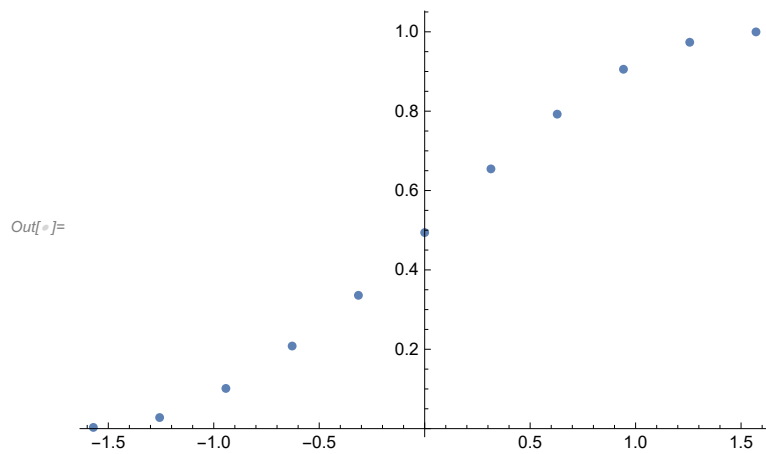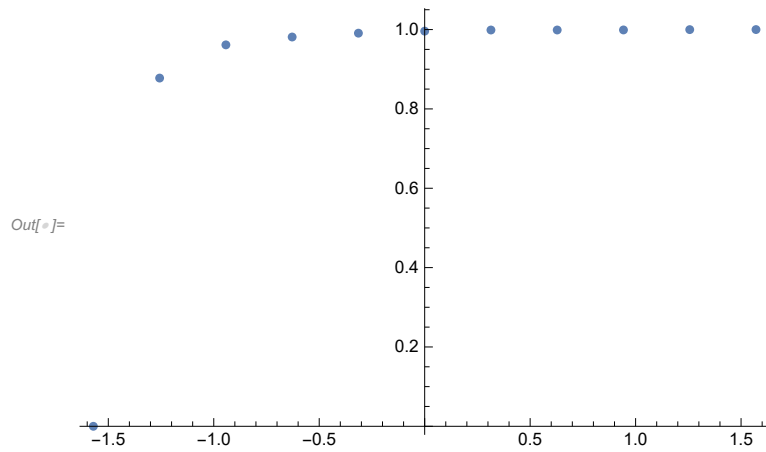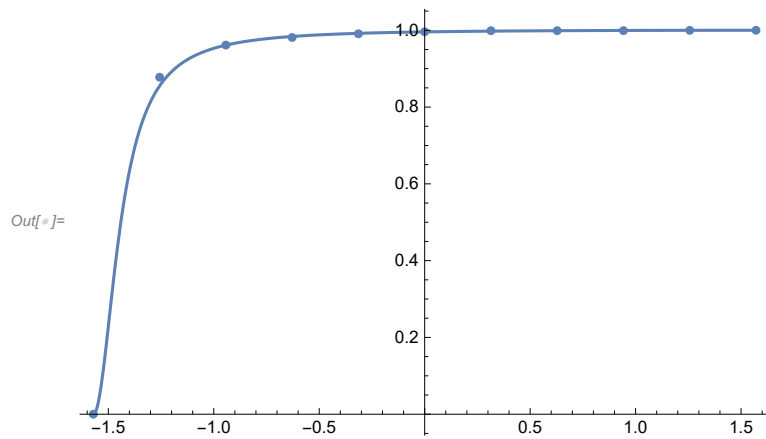Out[•]= 0

Out[•]= 25

Out[•]= 8167

Out[•]= $\left\{\left\{-\frac{\pi}{2}, 0\right\}, \left\{-1.25664, \frac{201}{229}\right\}, \left\{-0.942478, \frac{399}{415}\right\},\right.$
$\left\{-0.628319, \frac{1673}{1705}\right\}, \left\{-0.314159, \frac{2727}{2752}\right\}, \left\{0., \frac{252}{253}\right\}, \left\{0.314159, \frac{2678}{2681}\right\},$
$\left.\left\{0.628319, \frac{6485}{6492}\right\}, \left\{0.942478, \frac{7412}{7419}\right\}, \left\{1.25664, \frac{7975}{7976}\right\}, \left\{\frac{\pi}{2}, 1\right\}\right\}$
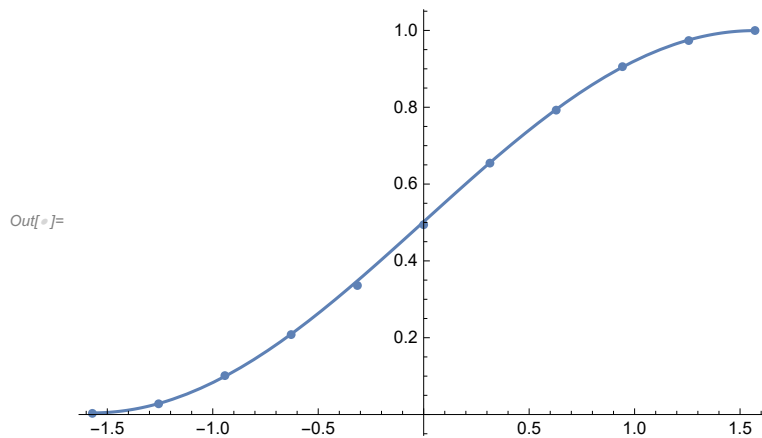
Out[•]= $\left\{\left\{-\frac{\pi}{2}, \frac{25}{8192}\right\}, \left\{-1.25664, \frac{229}{8192}\right\}, \left\{-0.942478, \frac{415}{4096}\right\},\right.$
$\left\{-0.628319, \frac{1705}{8192}\right\}, \left\{-0.314159, \frac{43}{128}\right\}, \left\{0., \frac{253}{512}\right\}, \left\{0.314159, \frac{2681}{4096}\right\},$
$\left.\left\{0.628319, \frac{1623}{2048}\right\}, \left\{0.942478, \frac{7419}{8192}\right\}, \left\{1.25664, \frac{997}{1024}\right\}, \left\{1.5708, \frac{4095}{4096}\right\}\right\}$

Out[●]=

Out[●]=

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

Out[●]=

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

Out[ ]=

(graph showing an S-shaped sigmoid curve rising from near 0 at x = -1.5 to 1.0 at x = 1.5, with data points along the curve)

In[ ]:= **(*simulator_statevector*)**
ZeroZeroFirst10simulatorstatevector = 8187
ZeroOneFirst10simulatorstatevector = 5
OneZeroFirst10simulatorstatevector = 0
OneOneFirst10simulatorstatevector = 0

ZeroZeroFirst08simulatorstatevector = 7984
ZeroOneFirst08simulatorstatevector = 1
OneZeroFirst08simulatorstatevector = 1
OneOneFirst08simulatorstatevector = 206

ZeroZeroFirst06simulatorstatevector = 7436
ZeroOneFirst06simulatorstatevector = 3
OneZeroFirst06simulatorstatevector = 4
OneOneFirst06simulatorstatevector = 749

ZeroZeroFirst04simulatorstatevector = 6471
ZeroOneFirst04simulatorstatevector = 2
OneZeroFirst04simulatorstatevector = 9
OneOneFirst04simulatorstatevector = 1710

ZeroZeroFirst02simulatorstatevector = 5375
ZeroOneFirst02simulatorstatevector = 3
OneZeroFirst02simulatorstatevector = 10
OneOneFirst02simulatorstatevector = 2804

ZeroZeroFirst00simulatorstatevector = 4097
ZeroOneFirst00simulatorstatevector = 2
OneZeroFirst00simulatorstatevector = 26
OneOneFirst00simulatorstatevector = 4067

ZeroZeroSecond02simulatorstatevector = 2931
ZeroOneSecond02simulatorstatevector = 1
OneZeroSecond02simulatorstatevector = 21
OneOneSecond02simulatorstatevector = 5239

```
ZeroZeroSecond04simulatorstatevector = 1712
ZeroOneSecond04simulatorstatevector = 0
OneZeroSecond04simulatorstatevector = 26
OneOneSecond04simulatorstatevector = 6454

ZeroZeroSecond06simulatorstatevector = 769
ZeroOneSecond06simulatorstatevector = 1
OneZeroSecond06simulatorstatevector = 27
OneOneSecond06simulatorstatevector = 7395

ZeroZeroSecond08simulatorstatevector = 206
ZeroOneSecond08simulatorstatevector = 0
OneZeroSecond08simulatorstatevector = 43
OneOneSecond08simulatorstatevector = 7943

ZeroZeroSecond10simulatorstatevector = 0
ZeroOneSecond10simulatorstatevector = 0
OneZeroSecond10simulatorstatevector = 31
OneOneSecond10simulatorstatevector = 8161
```

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

```
    {π/2 * 1, ZeroZeroFirst10simulatorstatevector /

      (OneZeroFirst10simulatorstatevector + ZeroZeroFirst10simulatorstatevector)}}
  Decisivenesssimulatorstatevector = {{-π/2 * 1,

    (OneZeroSecond10simulatorstatevector + ZeroZeroSecond10simulatorstatevector) / 8192},

   {-π/2 * 0.8, (OneZeroSecond08simulatorstatevector + ZeroZeroSecond08simulatorstatevector) /

     8192}, {-π/2 * 0.6,

    (OneZeroSecond06simulatorstatevector + ZeroZeroSecond06simulatorstatevector) / 8192},

   {-π/2 * 0.4, (OneZeroSecond04simulatorstatevector + ZeroZeroSecond04simulatorstatevector) /

     8192}, {-π/2 * 0.2,

    (OneZeroSecond02simulatorstatevector + ZeroZeroSecond02simulatorstatevector) / 8192},

   {-π/2 * 0.0, (OneZeroFirst00simulatorstatevector + ZeroZeroFirst00simulatorstatevector) /

     8192}, {π/2 * 0.2,

    (OneZeroFirst02simulatorstatevector + ZeroZeroFirst02simulatorstatevector) / 8192},

   {π/2 * 0.4, (OneZeroFirst04simulatorstatevector + ZeroZeroFirst04simulatorstatevector) /

     8192}, {π/2 * 0.6,

    (OneZeroFirst06simulatorstatevector + ZeroZeroFirst06simulatorstatevector) / 8192},

   {π/2 * 0.8, (OneZeroFirst08simulatorstatevector + ZeroZeroFirst08simulatorstatevector) /

     8192}, {π/2 * 1.0,

    (OneZeroFirst10simulatorstatevector + ZeroZeroFirst10simulatorstatevector) / 8192}}
  ExpCosSqsimulatorstatevector = ListPlot[CosSqsimulatorstatevector]
  ExpDecisivenesssimulatorstatevector = ListPlot[Decisivenesssimulatorstatevector]
```

Out[●]= 8187

Out[●]= 5

Out[●]= 0

Out[●]= 0

Out[●]= 7984

Out[●]= 1

Out[●]= 1

Out[●]= 206

Out[●]= 7436

Out[●]= 3

Out[ ]= 4

Out[ ]= 749

Out[ ]= 6471

Out[ ]= 2

Out[ ]= 9

Out[ ]= 1710

Out[ ]= 5375

Out[ ]= 3

Out[ ]= 10

Out[ ]= 2804

Out[ ]= 4097

Out[ ]= 2

Out[ ]= 26

Out[ ]= 4067

Out[ ]= 2931

Out[ ]= 1

Out[ ]= 21

Out[ ]= 5239

Out[ ]= 1712

Out[ ]= 0

Out[ ]= 26

Out[ ]= 6454

Out[ ]= 769

Out[ ]= 1

Out[ ]= 27

Out[ ]= 7395

Out[ ]= 206

Out[ ]= 0

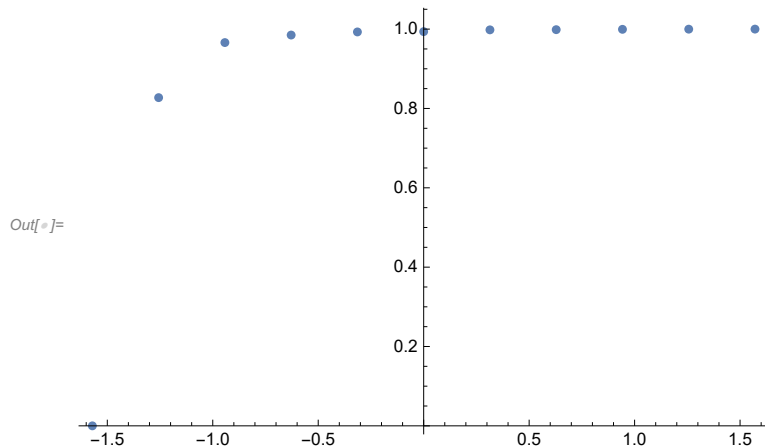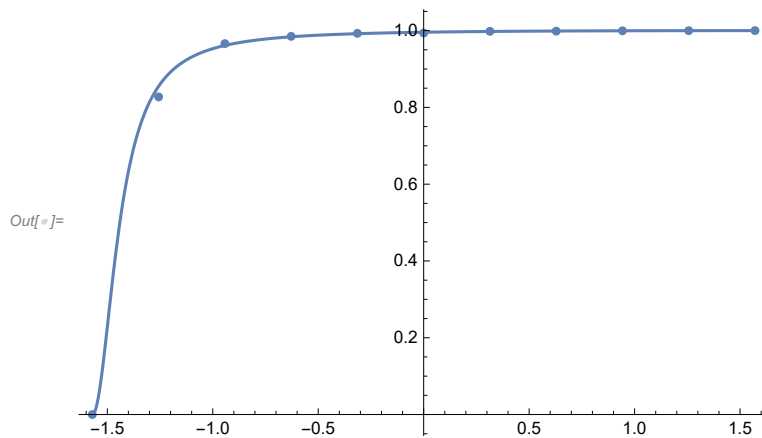*Out[ ]=* 43

Out[ ]= 7943

Out[ ]= 0

Out[•]= 0

Out[•]= 31

Out[•]= 8161

Out[•]= $\left\{\left\{-\dfrac{\pi}{2}, 0\right\}, \left\{-1.25664, \dfrac{206}{249}\right\}, \left\{-0.942478, \dfrac{769}{796}\right\},\right.$

$\left\{-0.628319, \dfrac{856}{869}\right\}, \left\{-0.314159, \dfrac{977}{984}\right\}, \left\{0., \dfrac{4097}{4123}\right\}, \left\{0.314159, \dfrac{1075}{1077}\right\},$

$\left.\left\{0.628319, \dfrac{719}{720}\right\}, \left\{0.942478, \dfrac{1859}{1860}\right\}, \left\{1.25664, \dfrac{7984}{7985}\right\}, \left\{\dfrac{\pi}{2}, 1\right\}\right\}$
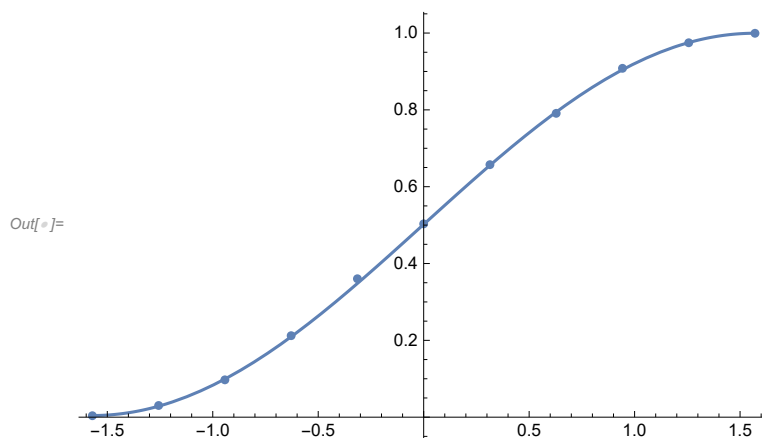
Out[•]= $\left\{\left\{-\dfrac{\pi}{2}, \dfrac{31}{8192}\right\}, \left\{-1.25664, \dfrac{249}{8192}\right\}, \left\{-0.942478, \dfrac{199}{2048}\right\},\right.$

$\left\{-0.628319, \dfrac{869}{4096}\right\}, \left\{-0.314159, \dfrac{369}{1024}\right\}, \left\{0., \dfrac{4123}{8192}\right\}, \left\{0.314159, \dfrac{5385}{8192}\right\},$

$\left.\left\{0.628319, \dfrac{405}{512}\right\}, \left\{0.942478, \dfrac{465}{512}\right\}, \left\{1.25664, \dfrac{7985}{8192}\right\}, \left\{1.5708, \dfrac{8187}{8192}\right\}\right\}$
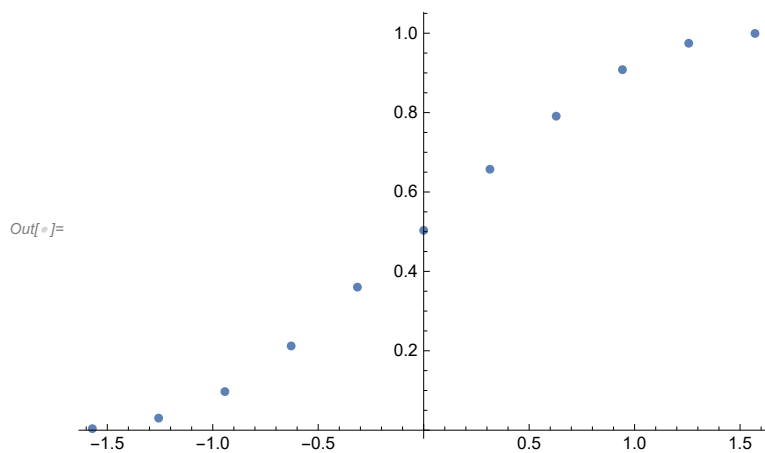
Out[•]=

Out[•]=

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

Out[ ]=

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

Out[ ]=

In[ ]:= **(*ibm_nairobi*)**
ZeroZeroFirst10ibmnairobi = 7336
ZeroOneFirst10ibmnairobi = 233
OneZeroFirst10ibmnairobi = 217
OneOneFirst10ibmnairobi = 406

ZeroZeroFirst08ibmnairobi = 6896
ZeroOneFirst08ibmnairobi = 259
OneZeroFirst08ibmnairobi = 167
OneOneFirst08ibmnairobi = 870

ZeroZeroFirst06ibmnairobi = 6051
ZeroOneFirst06ibmnairobi = 308
OneZeroFirst06ibmnairobi = 209
OneOneFirst06ibmnairobi = 1624

ZeroZeroFirst04ibmnairobi = 5011
ZeroOneFirst04ibmnairobi = 315
OneZeroFirst04ibmnairobi = 215
OneOneFirst04ibmnairobi = 2651

```
ZeroZeroFirst02ibmnairobi = 3861
ZeroOneFirst02ibmnairobi = 422
OneZeroFirst02ibmnairobi = 230
OneOneFirst02ibmnairobi = 3679

ZeroZeroFirst00ibmnairobi = 2791
ZeroOneFirst00ibmnairobi = 880
OneZeroFirst00ibmnairobi = 275
OneOneFirst00ibmnairobi = 4246

ZeroZeroSecond02ibmnairobi = 1796
ZeroOneSecond02ibmnairobi = 899
OneZeroSecond02ibmnairobi = 305
OneOneSecond02ibmnairobi = 5192

ZeroZeroSecond04ibmnairobi = 935
ZeroOneSecond04ibmnairobi = 1065
OneZeroSecond04ibmnairobi = 325
OneOneSecond04ibmnairobi = 5867

ZeroZeroSecond06ibmnairobi = 681
ZeroOneSecond06ibmnairobi = 859
OneZeroSecond06ibmnairobi = 401
OneOneSecond06ibmnairobi = 6251

ZeroZeroSecond08ibmnairobi = 267
ZeroOneSecond08ibmnairobi = 945
OneZeroSecond08ibmnairobi = 395
OneOneSecond08ibmnairobi = 6585

ZeroZeroSecond10ibmnairobi = 486
ZeroOneSecond10ibmnairobi = 1160
OneZeroSecond10ibmnairobi = 351
OneOneSecond10ibmnairobi = 6195
```

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

```
        (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[●]= 7336

Out[●]= 233

Out[●]= 217

Out[●]= 406

Out[●]= 6896

Out[●]= 259

Out[●]= 167

Out[●]= 870

Out[●]= 6051

Out[●]= 308

Out[●]= 209

Out[●]= 1624

Out[●]= 5011

Out[●]= 315

Out[●]= 215

Out[●]= 2651

Out[●]= 3861

Out[●]= 422

Out[●]= 230

Out[●]= 3679

Out[•]= 2791

Out[•]= 880

Out[•]= 275

Out[•]= 4246

Out[•]= 1796

Out[•]= 899

Out[•]= 305

Out[•]= 5192

Out[•]= 935

Out[•]= 1065

Out[•]= 325

Out[•]= 5867

Out[•]= 681

Out[•]= 859

Out[•]= 401

Out[•]= 6251

Out[•]= 267

Out[•]= 945

Out[•]= 395

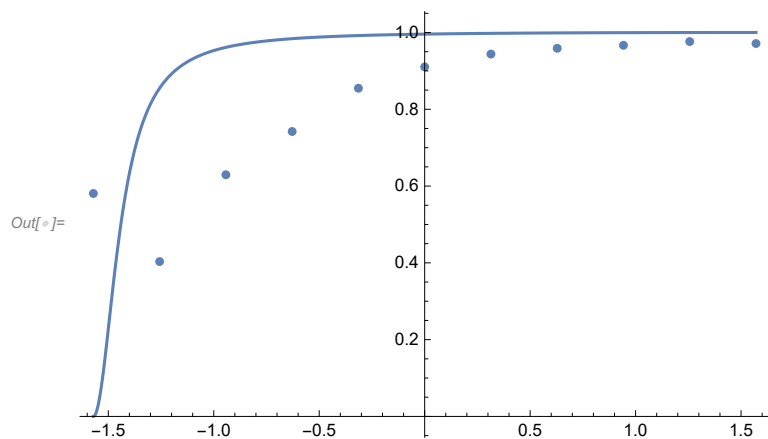*Out[•]=* 6585

Out[•]= 486

Out[•]= 1160

Out[•]= 351

Out[•]= 6195

Out[•]= $\left\{\left\{-\frac{\pi}{2}, \frac{18}{31}\right\}, \left\{-1.25664, \frac{267}{662}\right\}, \left\{-0.942478, \frac{681}{1082}\right\},\right.$
$\left\{-0.628319, \frac{187}{252}\right\}, \left\{-0.314159, \frac{1796}{2101}\right\}, \left\{0., \frac{2791}{3066}\right\}, \left\{0.314159, \frac{3861}{4091}\right\},$
$\left.\left\{0.628319, \frac{5011}{5226}\right\}, \left\{0.942478, \frac{6051}{6260}\right\}, \left\{1.25664, \frac{6896}{7063}\right\}, \left\{\frac{\pi}{2}, \frac{1048}{1079}\right\}\right\}$
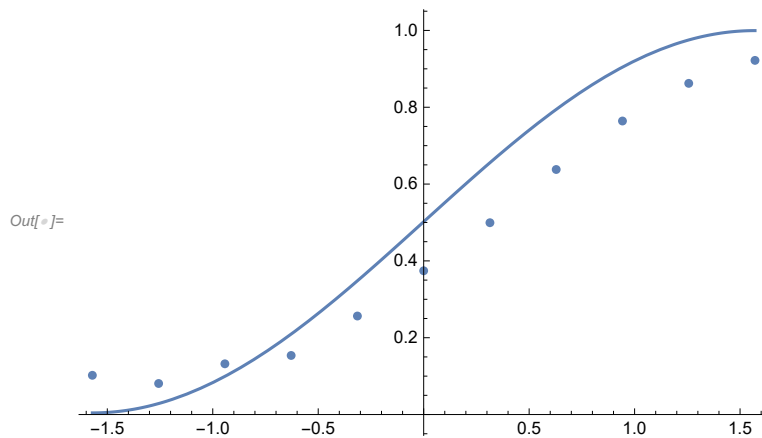
Out[●]= $\left\{\left\{-\dfrac{\pi}{2}, \dfrac{837}{8192}\right\}, \left\{-1.25664, \dfrac{331}{4096}\right\}, \left\{-0.942478, \dfrac{541}{4096}\right\},\right.$

$\left\{-0.628319, \dfrac{315}{2048}\right\}, \left\{-0.314159, \dfrac{2101}{8192}\right\}, \left\{0., \dfrac{1533}{4096}\right\}, \left\{0.314159, \dfrac{4091}{8192}\right\},$

$\left.\left\{0.628319, \dfrac{2613}{4096}\right\}, \left\{0.942478, \dfrac{1565}{2048}\right\}, \left\{1.25664, \dfrac{7063}{8192}\right\}, \left\{1.5708, \dfrac{7553}{8192}\right\}\right\}$

Out[●]=

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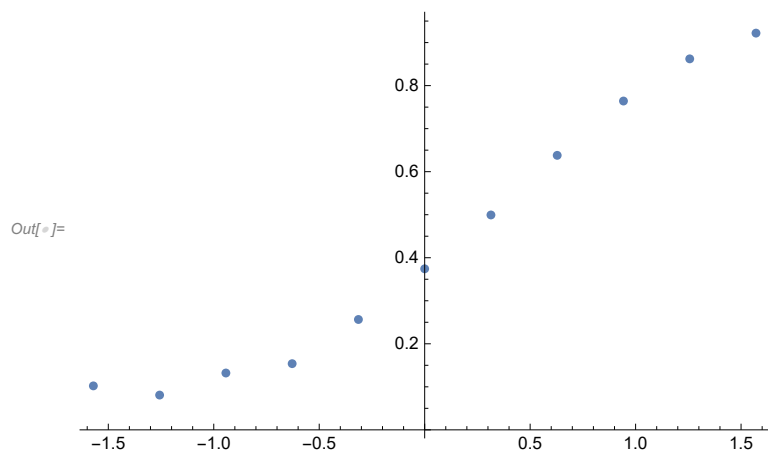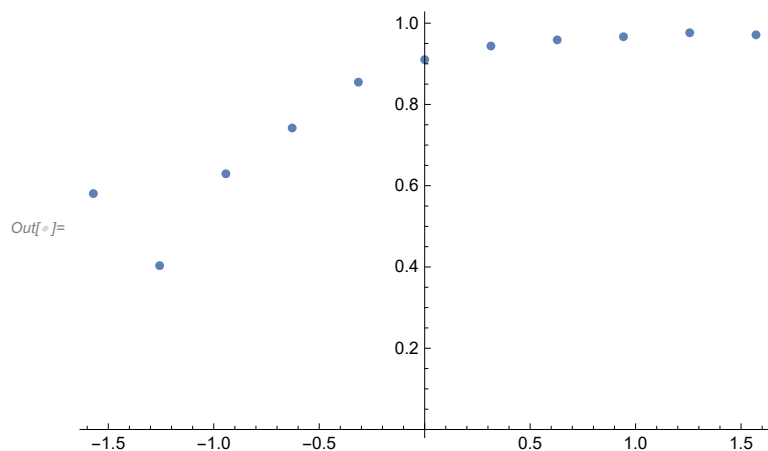
In[●]:= **Show[cosTH, ExpCosSqibmnairobi]**

Out[●]=

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

Out[ ]=

In[ ]:= **(*ibm_oslo*)**
ZeroZeroFirst10ibmoslo = 7008
ZeroOneFirst10ibmoslo = 864
OneZeroFirst10ibmoslo = 183
OneOneFirst10ibmoslo = 137

ZeroZeroFirst08ibmoslo = 6786
ZeroOneFirst08ibmoslo = 843
OneZeroFirst08ibmoslo = 206
OneOneFirst08ibmoslo = 357

ZeroZeroFirst06ibmoslo = 6399
ZeroOneFirst06ibmoslo = 658
OneZeroFirst06ibmoslo = 248
OneOneFirst06ibmoslo = 887

ZeroZeroFirst04ibmoslo = 5534
ZeroOneFirst04ibmoslo = 688
OneZeroFirst04ibmoslo = 221
OneOneFirst04ibmoslo = 1749

ZeroZeroFirst02ibmoslo = 4543
ZeroOneFirst02ibmoslo = 627
OneZeroFirst02ibmoslo = 195
OneOneFirst02ibmoslo = 2827

ZeroZeroFirst00ibmoslo = 3584
ZeroOneFirst00ibmoslo = 454
OneZeroFirst00ibmoslo = 219
OneOneFirst00ibmoslo = 3935

ZeroZeroSecond02ibmoslo = 2491
ZeroOneSecond02ibmoslo = 329
OneZeroSecond02ibmoslo = 193
OneOneSecond02ibmoslo = 5179

```
ZeroZeroSecond04ibmoslo = 1526
ZeroOneSecond04ibmoslo = 276
OneZeroSecond04ibmoslo = 203
OneOneSecond04ibmoslo = 6187

ZeroZeroSecond06ibmoslo = 704
ZeroOneSecond06ibmoslo = 193
OneZeroSecond06ibmoslo = 210
OneOneSecond06ibmoslo = 7085

ZeroZeroSecond08ibmoslo = 304
ZeroOneSecond08ibmoslo = 137
OneZeroSecond08ibmoslo = 182
OneOneSecond08ibmoslo = 7569

ZeroZeroSecond10ibmoslo = 163
ZeroOneSecond10ibmoslo = 134
OneZeroSecond10ibmoslo = 252
OneOneSecond10ibmoslo = 7643
```

```
CosSqibmoslo =
 {{- π/2 * 1, ZeroZeroSecond10ibmoslo / (OneZeroSecond10ibmoslo + ZeroZeroSecond10ibmoslo)},

  {- π/2 * 0.8, ZeroZeroSecond08ibmoslo / (OneZeroSecond08ibmoslo + ZeroZeroSecond08ibmoslo)},

  {- π/2 * 0.6, ZeroZeroSecond06ibmoslo / (OneZeroSecond06ibmoslo + ZeroZeroSecond06ibmoslo)},

  {- π/2 * 0.4, ZeroZeroSecond04ibmoslo / (OneZeroSecond04ibmoslo + ZeroZeroSecond04ibmoslo)},

  {- π/2 * 0.2, ZeroZeroSecond02ibmoslo / (OneZeroSecond02ibmoslo + ZeroZeroSecond02ibmoslo)},

  {π/2 * 0.0, ZeroZeroFirst00ibmoslo / (OneZeroFirst00ibmoslo + ZeroZeroFirst00ibmoslo)},

  {π/2 * 0.2, ZeroZeroFirst02ibmoslo / (OneZeroFirst02ibmoslo + ZeroZeroFirst02ibmoslo)},

  {π/2 * 0.4, ZeroZeroFirst04ibmoslo / (OneZeroFirst04ibmoslo + ZeroZeroFirst04ibmoslo)},

  {π/2 * 0.6, ZeroZeroFirst06ibmoslo / (OneZeroFirst06ibmoslo + ZeroZeroFirst06ibmoslo)},

  {π/2 * 0.8, ZeroZeroFirst08ibmoslo / (OneZeroFirst08ibmoslo + ZeroZeroFirst08ibmoslo)},

  {π/2 * 1, ZeroZeroFirst10ibmoslo / (OneZeroFirst10ibmoslo + ZeroZeroFirst10ibmoslo)}}

Decisivenessibmoslo = {{- π/2 * 1, (OneZeroSecond10ibmoslo + ZeroZeroSecond10ibmoslo) / 8192},

  {- π/2 * 0.8, (OneZeroSecond08ibmoslo + ZeroZeroSecond08ibmoslo) / 8192},

  {- π/2 * 0.6, (OneZeroSecond06ibmoslo + ZeroZeroSecond06ibmoslo) / 8192},

  {- π/2 * 0.4, (OneZeroSecond04ibmoslo + ZeroZeroSecond04ibmoslo) / 8192},
```

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

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

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

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

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

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

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

```
ExpCosSqibmoslo = ListPlot[CosSqibmoslo]
ExpDecisivenessibmoslo = ListPlot[Decisivenessibmoslo]
```

Out[●]= 7008

Out[●]= 864

Out[●]= 183

Out[●]= 137

Out[●]= 6786

Out[●]= 843

Out[●]= 206

Out[●]= 357

Out[●]= 6399

Out[●]= 658

Out[●]= 248

Out[●]= 887

Out[●]= 5534

Out[●]= 688

Out[●]= 221

Out[●]= 1749

Out[●]= 4543

Out[●]= 627

Out[●]= 195

Out[●]= 2827

Out[●]= 3584

Out[•]= 454

Out[•]= 219

Out[•]= 3935

Out[•]= 2491

Out[•]= 329

Out[•]= 193

Out[•]= 5179

Out[•]= 1526

Out[•]= 276

Out[•]= 203

Out[•]= 6187

Out[•]= 704

Out[•]= 193

Out[•]= 210

Out[•]= 7085

Out[•]= 304

Out[•]= 137

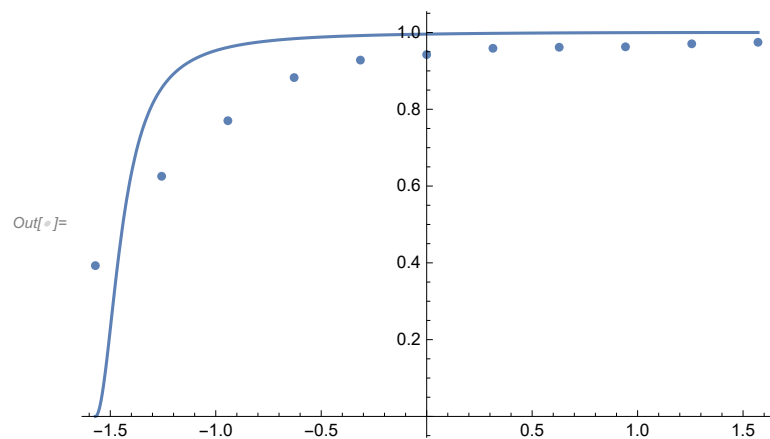Out[•]= 182

Out[•]= 7569

Out[•]= 163

Out[•]= 134

Out[•]= 252

Out[•]= 7643

Out[•]= $\left\{\left\{-\frac{\pi}{2}, \frac{163}{415}\right\}, \left\{-1.25664, \frac{152}{243}\right\}, \left\{-0.942478, \frac{352}{457}\right\},\right.$
$\left\{-0.628319, \frac{218}{247}\right\}, \left\{-0.314159, \frac{2491}{2684}\right\}, \left\{0., \frac{3584}{3803}\right\}, \left\{0.314159, \frac{4543}{4738}\right\},$
$\left\{0.628319, \frac{5534}{5755}\right\}, \left\{0.942478, \frac{6399}{6647}\right\}, \left\{1.25664, \frac{3393}{3496}\right\}, \left\{\frac{\pi}{2}, \frac{2336}{2397}\right\}\right\}$
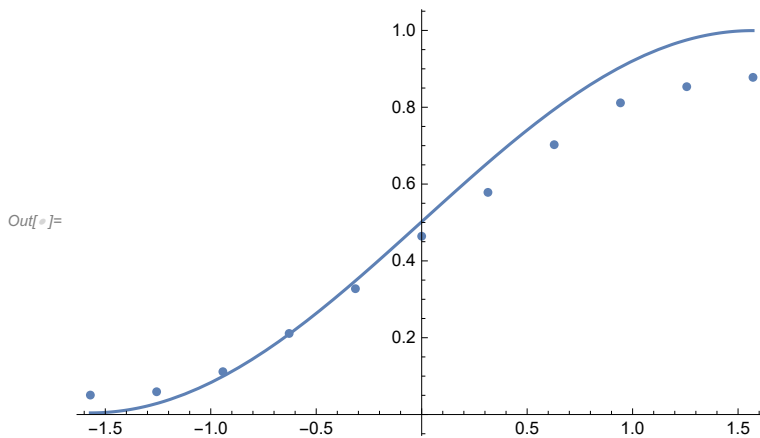
Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{415}{8192}\right\}, \left\{-1.25664, \frac{243}{4096}\right\}, \left\{-0.942478, \frac{457}{4096}\right\},\right.$

$\left\{-0.628319, \frac{1729}{8192}\right\}, \left\{-0.314159, \frac{671}{2048}\right\}, \left\{0., \frac{3803}{8192}\right\}, \left\{0.314159, \frac{2369}{4096}\right\},$

$\left\{0.628319, \frac{5755}{8192}\right\}, \left\{0.942478, \frac{6647}{8192}\right\}, \left\{1.25664, \frac{437}{512}\right\}, \left\{1.5708, \frac{7191}{8192}\right\}\right\}$

Out[ ]=

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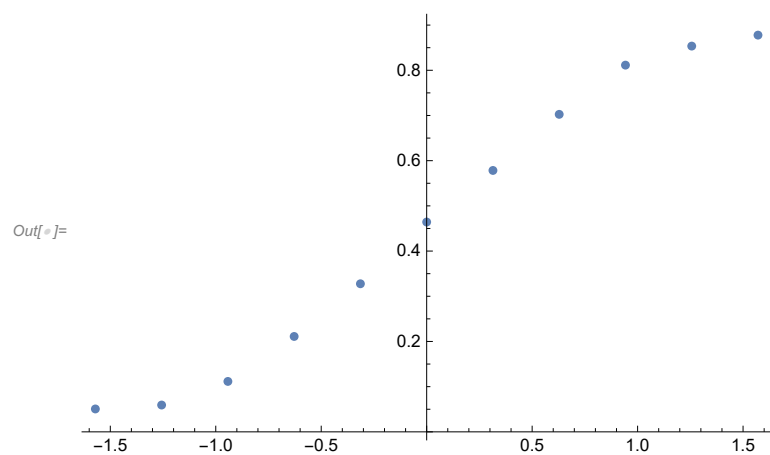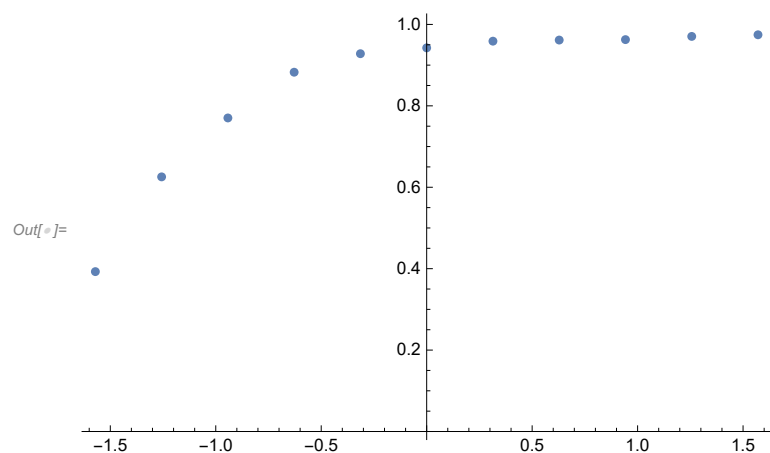
In[ ]:= **Show[cosTH, ExpCosSqibmoslo]**

Out[ ]=

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

Out[ ]=

In[ ]:= **(*ibmq_manila*)**
ZeroZeroFirst10ibmqmanila = 7796
ZeroOneFirst10ibmqmanila = 152
OneZeroFirst10ibmqmanila = 149
OneOneFirst10ibmqmanila = 95

ZeroZeroFirst08ibmqmanila = 7561
ZeroOneFirst08ibmqmanila = 166
OneZeroFirst08ibmqmanila = 158
OneOneFirst08ibmqmanila = 307

ZeroZeroFirst06ibmqmanila = 7004
ZeroOneFirst06ibmqmanila = 191
OneZeroFirst06ibmqmanila = 168
OneOneFirst06ibmqmanila = 829

ZeroZeroFirst04ibmqmanila = 6000
ZeroOneFirst04ibmqmanila = 217
OneZeroFirst04ibmqmanila = 226
OneOneFirst04ibmqmanila = 1749

ZeroZeroFirst02ibmqmanila = 5042
ZeroOneFirst02ibmqmanila = 230
OneZeroFirst02ibmqmanila = 221
OneOneFirst02ibmqmanila = 2699

ZeroZeroFirst00ibmqmanila = 3787
ZeroOneFirst00ibmqmanila = 287
OneZeroFirst00ibmqmanila = 273
OneOneFirst00ibmqmanila = 3845

ZeroZeroSecond02ibmqmanila = 2544
ZeroOneSecond02ibmqmanila = 356
OneZeroSecond02ibmqmanila = 344
OneOneSecond02ibmqmanila = 4948

```
ZeroZeroSecond04ibmqmanila = 1554
ZeroOneSecond04ibmqmanila = 385
OneZeroSecond04ibmqmanila = 416
OneOneSecond04ibmqmanila = 5837

ZeroZeroSecond06ibmqmanila = 707
ZeroOneSecond06ibmqmanila = 379
OneZeroSecond06ibmqmanila = 501
OneOneSecond06ibmqmanila = 6605

ZeroZeroSecond08ibmqmanila = 267
ZeroOneSecond08ibmqmanila = 360
OneZeroSecond08ibmqmanila = 512
OneOneSecond08ibmqmanila = 7053

ZeroZeroSecond10ibmqmanila = 95
ZeroOneSecond10ibmqmanila = 326
OneZeroSecond10ibmqmanila = 482
OneOneSecond10ibmqmanila = 7289
```

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

ZeroZeroSecond10ibmqmanila $/$ (OneZeroSecond10ibmqmanila + ZeroZeroSecond10ibmqmanila)$\}$,

$\left\{-\frac{\pi}{2} * 0.8,\right.$ ZeroZeroSecond08ibmqmanila $/$

(OneZeroSecond08ibmqmanila + ZeroZeroSecond08ibmqmanila)$\}$, $\left\{-\frac{\pi}{2} * 0.6,\right.$

ZeroZeroSecond06ibmqmanila $/$ (OneZeroSecond06ibmqmanila + ZeroZeroSecond06ibmqmanila)$\}$,

$\left\{-\frac{\pi}{2} * 0.4,\right.$ ZeroZeroSecond04ibmqmanila $/$

(OneZeroSecond04ibmqmanila + ZeroZeroSecond04ibmqmanila)$\}$, $\left\{-\frac{\pi}{2} * 0.2,\right.$

ZeroZeroSecond02ibmqmanila $/$ (OneZeroSecond02ibmqmanila + ZeroZeroSecond02ibmqmanila)$\}$,

$\left\{\frac{\pi}{2} * 0.0,\right.$ ZeroZeroFirst00ibmqmanila $/$

(OneZeroFirst00ibmqmanila + ZeroZeroFirst00ibmqmanila)$\}$, $\left\{\frac{\pi}{2} * 0.2,\right.$

ZeroZeroFirst02ibmqmanila $/$ (OneZeroFirst02ibmqmanila + ZeroZeroFirst02ibmqmanila)$\}$,

$\left\{\frac{\pi}{2} * 0.4,\right.$ ZeroZeroFirst04ibmqmanila $/$

(OneZeroFirst04ibmqmanila + ZeroZeroFirst04ibmqmanila)$\}$, $\left\{\frac{\pi}{2} * 0.6,\right.$

ZeroZeroFirst06ibmqmanila $/$ (OneZeroFirst06ibmqmanila + ZeroZeroFirst06ibmqmanila)$\}$,

$\left\{\frac{\pi}{2} * 0.8,\right.$ ZeroZeroFirst08ibmqmanila $/$

(OneZeroFirst08ibmqmanila + ZeroZeroFirst08ibmqmanila)$\}$, $\left\{\frac{\pi}{2} * 1,\right.$

ZeroZeroFirst10ibmqmanila $/$ (OneZeroFirst10ibmqmanila + ZeroZeroFirst10ibmqmanila)$\}\}$

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

(OneZeroSecond10ibmqmanila + ZeroZeroSecond10ibmqmanila) $/$ 8192$\}$,

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

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

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

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

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

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

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

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

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

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

```
ExpCosSqibmqmanila = ListPlot[CosSqibmqmanila]
ExpDecisivenessibmqmanila = ListPlot[Decisivenessibmqmanila]
```

Out[ ]= 7796

Out[ ]= 152

Out[ ]= 149

Out[ ]= 95

Out[ ]= 7561

Out[ ]= 166

Out[ ]= 158

Out[ ]= 307

Out[ ]= 7004

Out[ ]= 191

Out[ ]= 168

Out[ ]= 829

Out[ ]= 6000

Out[ ]= 217

Out[ ]= 226

Out[ ]= 1749

Out[ ]= 5042

Out[ ]= 230

Out[•]= 221

Out[•]= 2699

Out[•]= 3787

Out[•]= 287

Out[•]= 273

Out[•]= 3845

Out[•]= 2544

Out[•]= 356

Out[•]= 344

Out[•]= 4948

Out[•]= 1554

Out[•]= 385

Out[•]= 416

Out[•]= 5837

Out[•]= 707

Out[•]= 379

Out[•]= 501

Out[•]= 6605

Out[•]= 267

Out[•]= 360

Out[•]= 512

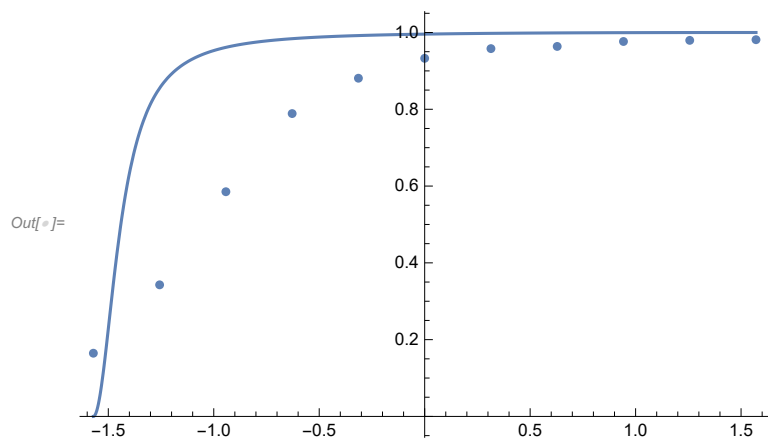*Out[•]=* 7053

Out[•]= 95

Out[•]= 326

Out[•]= 482

Out[•]= 7289

Out[•]= $\left\{\left\{-\frac{\pi}{2}, \frac{95}{577}\right\}, \left\{-1.25664, \frac{267}{779}\right\}, \left\{-0.942478, \frac{707}{1208}\right\},\right.$
$\left\{-0.628319, \frac{777}{985}\right\}, \left\{-0.314159, \frac{318}{361}\right\}, \left\{0., \frac{541}{580}\right\}, \left\{0.314159, \frac{5042}{5263}\right\},$
$\left.\left\{0.628319, \frac{3000}{3113}\right\}, \left\{0.942478, \frac{1751}{1793}\right\}, \left\{1.25664, \frac{7561}{7719}\right\}, \left\{\frac{\pi}{2}, \frac{7796}{7945}\right\}\right\}$
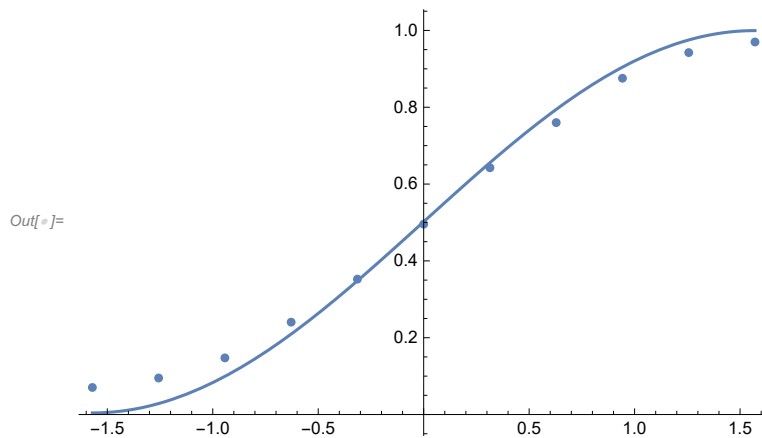
Out[•]= $\left\{\left\{-\dfrac{\pi}{2}, \dfrac{577}{8192}\right\}, \left\{-1.25664, \dfrac{779}{8192}\right\}, \left\{-0.942478, \dfrac{151}{1024}\right\},\right.$

$\left\{-0.628319, \dfrac{985}{4096}\right\}, \left\{-0.314159, \dfrac{361}{1024}\right\}, \left\{0., \dfrac{1015}{2048}\right\}, \left\{0.314159, \dfrac{5263}{8192}\right\},$

$\left.\left\{0.628319, \dfrac{3113}{4096}\right\}, \left\{0.942478, \dfrac{1793}{2048}\right\}, \left\{1.25664, \dfrac{7719}{8192}\right\}, \left\{1.5708, \dfrac{7945}{8192}\right\}\right\}$

Out[•]=

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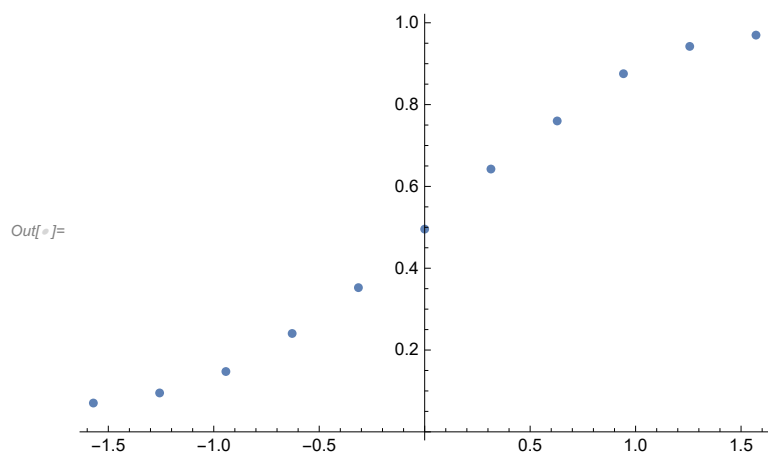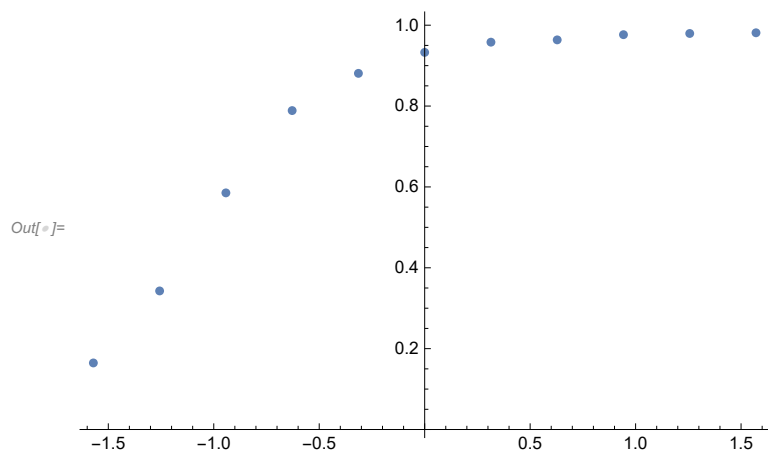
In[•]:= **Show[cosTH, ExpCosSqibmqmanila]**

Out[•]=

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

Out[ ]=

In[ ]:= **(*ibmq_quito*)**
ZeroZeroFirst10ibmqquito = 7686
ZeroOneFirst10ibmqquito = 187
OneZeroFirst10ibmqquito = 225
OneOneFirst10ibmqquito = 94

ZeroZeroFirst08ibmqquito = 7325
ZeroOneFirst08ibmqquito = 221
OneZeroFirst08ibmqquito = 222
OneOneFirst08ibmqquito = 424

ZeroZeroFirst06ibmqquito = 6660
ZeroOneFirst06ibmqquito = 262
OneZeroFirst06ibmqquito = 247
OneOneFirst06ibmqquito = 1023

ZeroZeroFirst04ibmqquito = 5797
ZeroOneFirst04ibmqquito = 281
OneZeroFirst04ibmqquito = 283
OneOneFirst04ibmqquito = 1831

ZeroZeroFirst02ibmqquito = 4651
ZeroOneFirst02ibmqquito = 336
OneZeroFirst02ibmqquito = 342
OneOneFirst02ibmqquito = 2863

ZeroZeroFirst00ibmqquito = 3485
ZeroOneFirst00ibmqquito = 344
OneZeroFirst00ibmqquito = 439
OneOneFirst00ibmqquito = 3924

ZeroZeroSecond02ibmqquito = 2283
ZeroOneSecond02ibmqquito = 405
OneZeroSecond02ibmqquito = 455
OneOneSecond02ibmqquito = 5049

```
ZeroZeroSecond04ibmqquito = 1304
ZeroOneSecond04ibmqquito = 380
OneZeroSecond04ibmqquito = 565
OneOneSecond04ibmqquito = 5943

ZeroZeroSecond06ibmqquito = 620
ZeroOneSecond06ibmqquito = 450
OneZeroSecond06ibmqquito = 534
OneOneSecond06ibmqquito = 6588

ZeroZeroSecond08ibmqquito = 175
ZeroOneSecond08ibmqquito = 419
OneZeroSecond08ibmqquito = 564
OneOneSecond08ibmqquito = 7034

ZeroZeroSecond10ibmqquito = 170
ZeroOneSecond10ibmqquito = 423
OneZeroSecond10ibmqquito = 582
OneOneSecond10ibmqquito = 7017
```

$\texttt{CosSqibmqquito} = \{\{-\frac{\pi}{2} * 1, \texttt{ZeroZeroSecond10ibmqquito}/$

$\quad (\texttt{OneZeroSecond10ibmqquito} + \texttt{ZeroZeroSecond10ibmqquito})\}, \{-\frac{\pi}{2} * 0.8,$

$\quad \texttt{ZeroZeroSecond08ibmqquito}/(\texttt{OneZeroSecond08ibmqquito} + \texttt{ZeroZeroSecond08ibmqquito})\},$

$\quad \{-\frac{\pi}{2} * 0.6, \texttt{ZeroZeroSecond06ibmqquito}/$

$\quad (\texttt{OneZeroSecond06ibmqquito} + \texttt{ZeroZeroSecond06ibmqquito})\}, \{-\frac{\pi}{2} * 0.4,$

$\quad \texttt{ZeroZeroSecond04ibmqquito}/(\texttt{OneZeroSecond04ibmqquito} + \texttt{ZeroZeroSecond04ibmqquito})\},$

$\quad \{-\frac{\pi}{2} * 0.2, \texttt{ZeroZeroSecond02ibmqquito}/$

$\quad (\texttt{OneZeroSecond02ibmqquito} + \texttt{ZeroZeroSecond02ibmqquito})\}, \{\frac{\pi}{2} * 0.0,$

$\quad \texttt{ZeroZeroFirst00ibmqquito}/(\texttt{OneZeroFirst00ibmqquito} + \texttt{ZeroZeroFirst00ibmqquito})\},$

$\quad \{\frac{\pi}{2} * 0.2, \texttt{ZeroZeroFirst02ibmqquito}/$

$\quad (\texttt{OneZeroFirst02ibmqquito} + \texttt{ZeroZeroFirst02ibmqquito})\}, \{\frac{\pi}{2} * 0.4,$

$\quad \texttt{ZeroZeroFirst04ibmqquito}/(\texttt{OneZeroFirst04ibmqquito} + \texttt{ZeroZeroFirst04ibmqquito})\},$

$\quad \{\frac{\pi}{2} * 0.6, \texttt{ZeroZeroFirst06ibmqquito}/$

$\quad (\texttt{OneZeroFirst06ibmqquito} + \texttt{ZeroZeroFirst06ibmqquito})\}, \{\frac{\pi}{2} * 0.8,$

$\quad \texttt{ZeroZeroFirst08ibmqquito}/(\texttt{OneZeroFirst08ibmqquito} + \texttt{ZeroZeroFirst08ibmqquito})\},$

$\quad \{\frac{\pi}{2} * 1, \texttt{ZeroZeroFirst10ibmqquito}/(\texttt{OneZeroFirst10ibmqquito} + \texttt{ZeroZeroFirst10ibmqquito})\}\}$

$\texttt{Decisivenessibmqquito} =$

$\quad \{\{-\frac{\pi}{2} * 1, (\texttt{OneZeroSecond10ibmqquito} + \texttt{ZeroZeroSecond10ibmqquito})/8192\},$

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

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

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

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

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

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

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

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

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

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

```
ExpCosSqibmqquito = ListPlot[CosSqibmqquito]
ExpDecisivenessibmqquito = ListPlot[Decisivenessibmqquito]
```

Out[ ]= 7686

Out[ ]= 187

Out[ ]= 225

Out[ ]= 94

Out[ ]= 7325

Out[ ]= 221

Out[ ]= 222

Out[ ]= 424

Out[ ]= 6660

Out[ ]= 262

Out[ ]= 247

Out[ ]= 1023

Out[ ]= 5797

Out[ ]= 281

Out[ ]= 283

Out[ ]= 1831

Out[ ]= 4651

Out[ ]= 336

Out[ ]= 342

Out[ ]= 2863

Out[ ]= 3485

Out[ ]= 344

Out[ ]= 439

Out[ ]= 3924

Out[ ]= 2283

Out[ ]= 405

Out[ ]= 455

Out[ ]= 5049

Out[ ]= 1304

Out[ ]= 380

Out[ ]= 565

Out[ ]= 5943

Out[ ]= 620

Out[ ]= 450

Out[ ]= 534

Out[ ]= 6588

Out[ ]= 175

Out[ ]= 419

Out[ ]= 564

Out[ ]= 7034

Out[ ]= 170

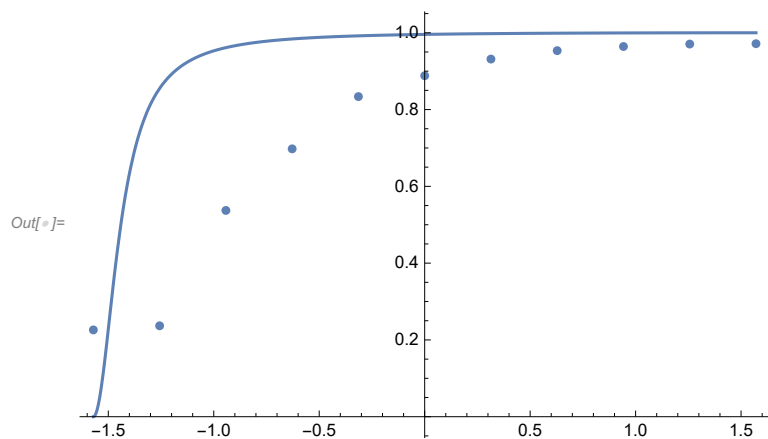*Out[ ]=* 423

Out[ ]= 582

Out[ ]= 7017

Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{85}{376}\right\}, \left\{-1.25664, \frac{175}{739}\right\}, \left\{-0.942478, \frac{310}{577}\right\},\right.$
$\left\{-0.628319, \frac{1304}{1869}\right\}, \left\{-0.314159, \frac{2283}{2738}\right\}, \left\{0., \frac{3485}{3924}\right\}, \left\{0.314159, \frac{4651}{4993}\right\},$
$\left.\left\{0.628319, \frac{5797}{6080}\right\}, \left\{0.942478, \frac{6660}{6907}\right\}, \left\{1.25664, \frac{7325}{7547}\right\}, \left\{\frac{\pi}{2}, \frac{854}{879}\right\}\right\}$

Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{47}{512}\right\}, \left\{-1.25664, \frac{739}{8192}\right\}, \left\{-0.942478, \frac{577}{4096}\right\},\right.$

$\left\{-0.628319, \frac{1869}{8192}\right\}, \left\{-0.314159, \frac{1369}{4096}\right\}, \left\{0., \frac{981}{2048}\right\}, \left\{0.314159, \frac{4993}{8192}\right\},$

$\left\{0.628319, \frac{95}{128}\right\}, \left\{0.942478, \frac{6907}{8192}\right\}, \left\{1.25664, \frac{7547}{8192}\right\}, \left\{1.5708, \frac{7911}{8192}\right\}\right\}$

Out[ ]=

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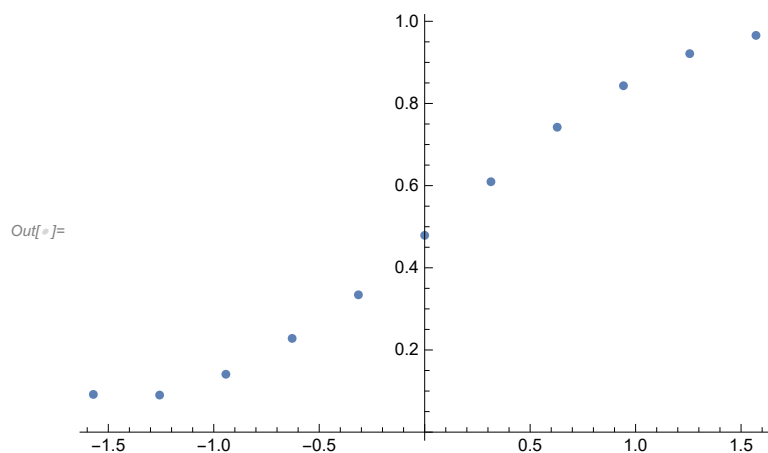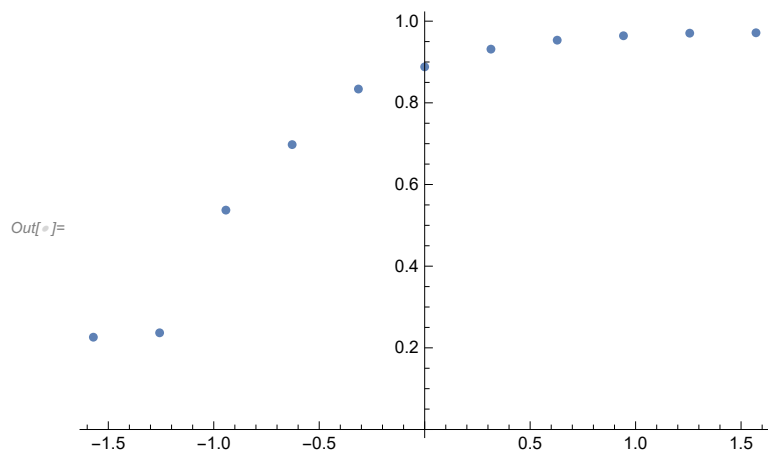
In[ ]:= **Show[cosTH, ExpCosSqibmqquito]**

Out[ ]=

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

Out[ ]=
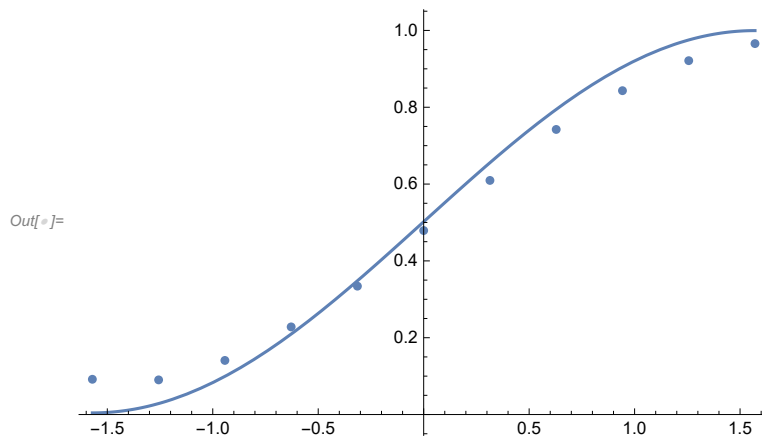
In[ ]:= **(*ibmq_lima*)**
ZeroZeroFirst10ibmqlima = 7772
ZeroOneFirst10ibmqlima = 192
OneZeroFirst10ibmqlima = 158
OneOneFirst10ibmqlima = 70

ZeroZeroFirst08ibmqlima = 7569
ZeroOneFirst08ibmqlima = 127
OneZeroFirst08ibmqlima = 147
OneOneFirst08ibmqlima = 349

ZeroZeroFirst06ibmqlima = 7013
ZeroOneFirst06ibmqlima = 136
OneZeroFirst06ibmqlima = 172
OneOneFirst06ibmqlima = 871

ZeroZeroFirst04ibmqlima = 6034
ZeroOneFirst04ibmqlima = 190
OneZeroFirst04ibmqlima = 214
OneOneFirst04ibmqlima = 1754

ZeroZeroFirst02ibmqlima = 4976
ZeroOneFirst02ibmqlima = 223
OneZeroFirst02ibmqlima = 244
OneOneFirst02ibmqlima = 2749

ZeroZeroFirst00ibmqlima = 3597
ZeroOneFirst00ibmqlima = 299
OneZeroFirst00ibmqlima = 368
OneOneFirst00ibmqlima = 3928

ZeroZeroSecond02ibmqlima = 2521
ZeroOneSecond02ibmqlima = 397
OneZeroSecond02ibmqlima = 353
OneOneSecond02ibmqlima = 4921

```
ZeroZeroSecond04ibmqlima = 1500
ZeroOneSecond04ibmqlima = 366
OneZeroSecond04ibmqlima = 388
OneOneSecond04ibmqlima = 5938

ZeroZeroSecond06ibmqlima = 719
ZeroOneSecond06ibmqlima = 409
OneZeroSecond06ibmqlima = 404
OneOneSecond06ibmqlima = 6660

ZeroZeroSecond08ibmqlima = 198
ZeroOneSecond08ibmqlima = 416
OneZeroSecond08ibmqlima = 422
OneOneSecond08ibmqlima = 7156

ZeroZeroSecond10ibmqlima = 107
ZeroOneSecond10ibmqlima = 435
OneZeroSecond10ibmqlima = 420
OneOneSecond10ibmqlima = 7230
```

CosSqibmqlima =
$\left\{\left\{-\frac{\pi}{2}*1,\ \text{ZeroZeroSecond10ibmqlima}\,/\,(\text{OneZeroSecond10ibmqlima}+\text{ZeroZeroSecond10ibmqlima})\right\},\right.$

$\left\{-\frac{\pi}{2}*0.8,\ \text{ZeroZeroSecond08ibmqlima}\,/\right.$

$\qquad\left.(\text{OneZeroSecond08ibmqlima}+\text{ZeroZeroSecond08ibmqlima})\right\},\ \left\{-\frac{\pi}{2}*0.6,\right.$

$\quad\left.\text{ZeroZeroSecond06ibmqlima}\,/\,(\text{OneZeroSecond06ibmqlima}+\text{ZeroZeroSecond06ibmqlima})\right\},$

$\left\{-\frac{\pi}{2}*0.4,\ \text{ZeroZeroSecond04ibmqlima}\,/\right.$

$\qquad\left.(\text{OneZeroSecond04ibmqlima}+\text{ZeroZeroSecond04ibmqlima})\right\},\ \left\{-\frac{\pi}{2}*0.2,\right.$

$\quad\left.\text{ZeroZeroSecond02ibmqlima}\,/\,(\text{OneZeroSecond02ibmqlima}+\text{ZeroZeroSecond02ibmqlima})\right\},$

$\left\{\frac{\pi}{2}*0.0,\ \text{ZeroZeroFirst00ibmqlima}\,/\,(\text{OneZeroFirst00ibmqlima}+\text{ZeroZeroFirst00ibmqlima})\right\},$

$\left\{\frac{\pi}{2}*0.2,\ \text{ZeroZeroFirst02ibmqlima}\,/\,(\text{OneZeroFirst02ibmqlima}+\text{ZeroZeroFirst02ibmqlima})\right\},$

$\left\{\frac{\pi}{2}*0.4,\ \text{ZeroZeroFirst04ibmqlima}\,/\,(\text{OneZeroFirst04ibmqlima}+\text{ZeroZeroFirst04ibmqlima})\right\},$

$\left\{\frac{\pi}{2}*0.6,\ \text{ZeroZeroFirst06ibmqlima}\,/\,(\text{OneZeroFirst06ibmqlima}+\text{ZeroZeroFirst06ibmqlima})\right\},$

$\left\{\frac{\pi}{2}*0.8,\ \text{ZeroZeroFirst08ibmqlima}\,/\,(\text{OneZeroFirst08ibmqlima}+\text{ZeroZeroFirst08ibmqlima})\right\},$

$\left\{\frac{\pi}{2}*1,\ \text{ZeroZeroFirst10ibmqlima}\,/\,(\text{OneZeroFirst10ibmqlima}+\text{ZeroZeroFirst10ibmqlima})\right\}\right\}$

Decisivenessibmqlima =
$\left\{\left\{-\frac{\pi}{2}*1,\ (\text{OneZeroSecond10ibmqlima}+\text{ZeroZeroSecond10ibmqlima})\,/\,8192\right\},\right.$

$\left\{-\frac{\pi}{2}*0.8,\ (\text{OneZeroSecond08ibmqlima}+\text{ZeroZeroSecond08ibmqlima})\,/\,8192\right\},$

$$\left\{-\frac{\pi}{2}*0.6,\;\left(\text{OneZeroSecond06ibmqlima}+\text{ZeroZeroSecond06ibmqlima}\right)\big/8192\right\},$$

$$\left\{-\frac{\pi}{2}*0.4,\;\left(\text{OneZeroSecond04ibmqlima}+\text{ZeroZeroSecond04ibmqlima}\right)\big/8192\right\},$$

$$\left\{-\frac{\pi}{2}*0.2,\;\left(\text{OneZeroSecond02ibmqlima}+\text{ZeroZeroSecond02ibmqlima}\right)\big/8192\right\},$$

$$\left\{-\frac{\pi}{2}*0.0,\;\left(\text{OneZeroFirst00ibmqlima}+\text{ZeroZeroFirst00ibmqlima}\right)\big/8192\right\},$$

$$\left\{\frac{\pi}{2}*0.2,\;\left(\text{OneZeroFirst02ibmqlima}+\text{ZeroZeroFirst02ibmqlima}\right)\big/8192\right\},$$

$$\left\{\frac{\pi}{2}*0.4,\;\left(\text{OneZeroFirst04ibmqlima}+\text{ZeroZeroFirst04ibmqlima}\right)\big/8192\right\},$$

$$\left\{\frac{\pi}{2}*0.6,\;\left(\text{OneZeroFirst06ibmqlima}+\text{ZeroZeroFirst06ibmqlima}\right)\big/8192\right\},$$

$$\left\{\frac{\pi}{2}*0.8,\;\left(\text{OneZeroFirst08ibmqlima}+\text{ZeroZeroFirst08ibmqlima}\right)\big/8192\right\},$$

$$\left\{\frac{\pi}{2}*1.0,\;\left(\text{OneZeroFirst10ibmqlima}+\text{ZeroZeroFirst10ibmqlima}\right)\big/8192\right\}\right\}$$

```
ExpCosSqibmqlima = ListPlot[CosSqibmqlima]
ExpDecisivenessibmqlima = ListPlot[Decisivenessibmqlima]
```

Out[●]= 7772

Out[●]= 192

Out[●]= 158

Out[●]= 70

Out[●]= 7569

Out[●]= 127

Out[●]= 147

Out[●]= 349

Out[●]= 7013

Out[●]= 136

Out[●]= 172

Out[●]= 871

Out[●]= 6034

Out[●]= 190

Out[●]= 214

Out[●]= 1754

Out[●]= 4976

Out[●]= 223

Out[●]= 244

Out[●]= 2749

Out[●]= 3597

Out[●]= 299

Out[●]= 368

Out[●]= 3928

Out[●]= 2521

Out[●]= 397

Out[●]= 353

Out[●]= 4921

Out[●]= 1500

Out[●]= 366

Out[●]= 388

Out[●]= 5938

Out[●]= 719

Out[●]= 409

Out[●]= 404

Out[●]= 6660

Out[●]= 198

Out[●]= 416

Out[●]= 422

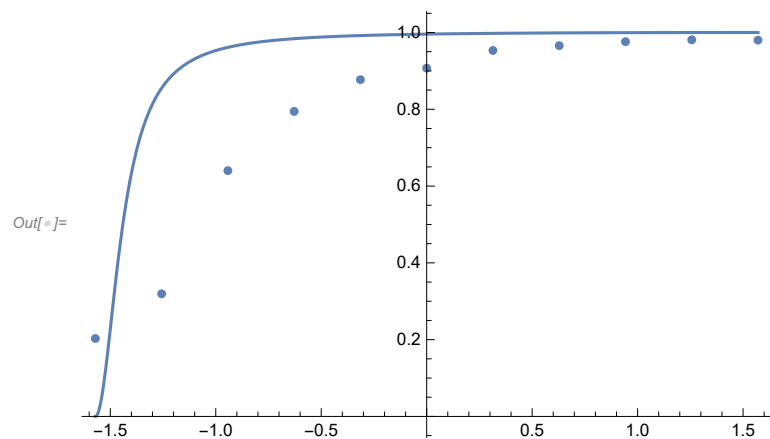*Out[●]=* 7156

Out[●]= 107

Out[●]= 435

Out[●]= 420

Out[●]= 7230

Out[●]= $\left\{\left\{-\frac{\pi}{2}, \frac{107}{527}\right\}, \left\{-1.25664, \frac{99}{310}\right\}, \left\{-0.942478, \frac{719}{1123}\right\},\right.$
$\left\{-0.628319, \frac{375}{472}\right\}, \left\{-0.314159, \frac{2521}{2874}\right\}, \left\{0., \frac{3597}{3965}\right\}, \left\{0.314159, \frac{1244}{1305}\right\},$
$\left\{0.628319, \frac{3017}{3124}\right\}, \left\{0.942478, \frac{7013}{7185}\right\}, \left\{1.25664, \frac{2523}{2572}\right\}, \left\{\frac{\pi}{2}, \frac{3886}{3965}\right\}\right\}$
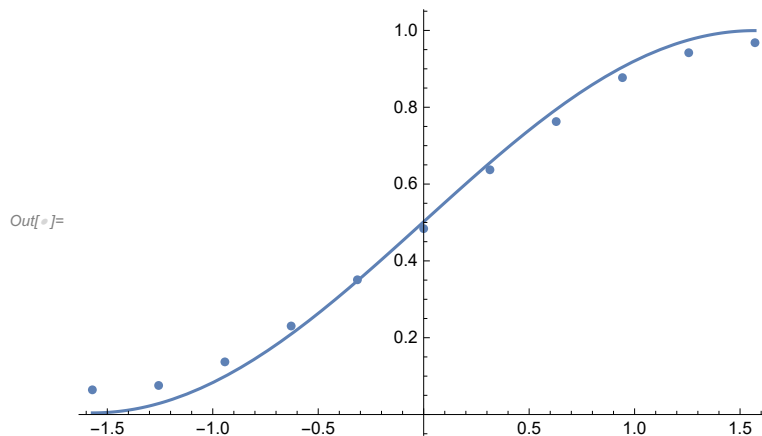
Out[ ]= $\left\{\left\{-\dfrac{\pi}{2}, \dfrac{527}{8192}\right\}, \{-1.25664, \dfrac{155}{2048}\}, \{-0.942478, \dfrac{1123}{8192}\},\right.$

$\{-0.628319, \dfrac{59}{256}\}, \{-0.314159, \dfrac{1437}{4096}\}, \{0., \dfrac{3965}{8192}\}, \{0.314159, \dfrac{1305}{2048}\},$

$\left.\{0.628319, \dfrac{781}{1024}\}, \{0.942478, \dfrac{7185}{8192}\}, \{1.25664, \dfrac{1929}{2048}\}, \{1.5708, \dfrac{3965}{4096}\}\right\}$
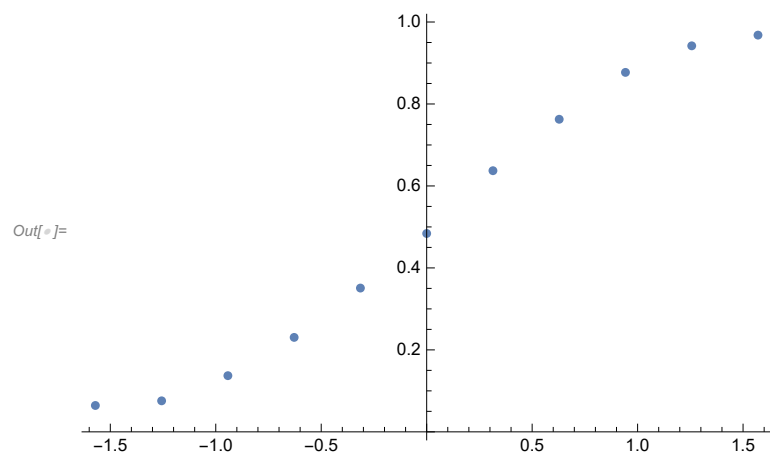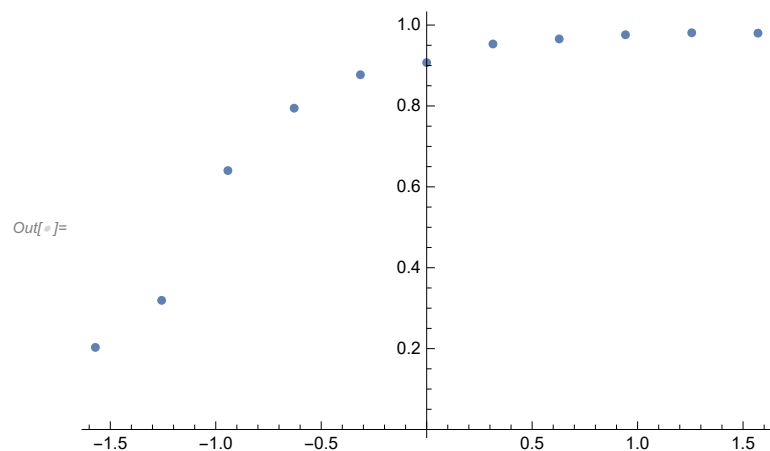
Out[ ]=

Out[ ]=

In[ ]:= Show[cosTH, ExpCosSqibmqlima]

Out[ ]=

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

Out[ ]=

In[ ]:= **(*ibmq_qasm_simulator*)**
ZeroZeroFirst10ibmqqasmsimulator = 8189
ZeroOneFirst10ibmqqasmsimulator = 3
OneZeroFirst10ibmqqasmsimulator = 0
OneOneFirst10ibmqqasmsimulator = 0

ZeroZeroFirst08ibmqqasmsimulator = 7970
ZeroOneFirst08ibmqqasmsimulator = 3
OneZeroFirst08ibmqqasmsimulator = 1
OneOneFirst08ibmqqasmsimulator = 218

ZeroZeroFirst06ibmqqasmsimulator = 7445
ZeroOneFirst06ibmqqasmsimulator = 4
OneZeroFirst06ibmqqasmsimulator = 4
OneOneFirst06ibmqqasmsimulator = 739

ZeroZeroFirst04ibmqqasmsimulator = 6516
ZeroOneFirst04ibmqqasmsimulator = 4
OneZeroFirst04ibmqqasmsimulator = 5
OneOneFirst04ibmqqasmsimulator = 1667

ZeroZeroFirst02ibmqqasmsimulator = 5359
ZeroOneFirst02ibmqqasmsimulator = 7
OneZeroFirst02ibmqqasmsimulator = 9
OneOneFirst02ibmqqasmsimulator = 2817

ZeroZeroFirst00ibmqqasmsimulator = 4082
ZeroOneFirst00ibmqqasmsimulator = 1
OneZeroFirst00ibmqqasmsimulator = 17
OneOneFirst00ibmqqasmsimulator = 4092

ZeroZeroSecond02ibmqqasmsimulator = 2865
ZeroOneSecond02ibmqqasmsimulator = 0
OneZeroSecond02ibmqqasmsimulator = 19
OneOneSecond02ibmqqasmsimulator = 5308

```
ZeroZeroSecond04ibmqqasmsimulator = 1626
ZeroOneSecond04ibmqqasmsimulator = 0
OneZeroSecond04ibmqqasmsimulator = 33
OneOneSecond04ibmqqasmsimulator = 6533

ZeroZeroSecond06ibmqqasmsimulator = 812
ZeroOneSecond06ibmqqasmsimulator = 0
OneZeroSecond06ibmqqasmsimulator = 33
OneOneSecond06ibmqqasmsimulator = 7347

ZeroZeroSecond08ibmqqasmsimulator = 218
ZeroOneSecond08ibmqqasmsimulator = 0
OneZeroSecond08ibmqqasmsimulator = 45
OneOneSecond08ibmqqasmsimulator = 7929

ZeroZeroSecond10ibmqqasmsimulator = 0
ZeroOneSecond10ibmqqasmsimulator = 0
OneZeroSecond10ibmqqasmsimulator = 39
OneOneSecond10ibmqqasmsimulator = 8153
```

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

```
      {π/2 * 1, ZeroZeroFirst10ibmqqasmsimulator /

         (OneZeroFirst10ibmqqasmsimulator + ZeroZeroFirst10ibmqqasmsimulator)}}
   Decisivenessibmqqasmsimulator = {{-π/2 * 1,

      (OneZeroSecond10ibmqqasmsimulator + ZeroZeroSecond10ibmqqasmsimulator) / 8192},

      {-π/2 * 0.8, (OneZeroSecond08ibmqqasmsimulator + ZeroZeroSecond08ibmqqasmsimulator) / 8192},

      {-π/2 * 0.6, (OneZeroSecond06ibmqqasmsimulator + ZeroZeroSecond06ibmqqasmsimulator) / 8192},

      {-π/2 * 0.4, (OneZeroSecond04ibmqqasmsimulator + ZeroZeroSecond04ibmqqasmsimulator) / 8192},

      {-π/2 * 0.2, (OneZeroSecond02ibmqqasmsimulator + ZeroZeroSecond02ibmqqasmsimulator) / 8192},

      {-π/2 * 0.0, (OneZeroFirst00ibmqqasmsimulator + ZeroZeroFirst00ibmqqasmsimulator) / 8192},

      {π/2 * 0.2, (OneZeroFirst02ibmqqasmsimulator + ZeroZeroFirst02ibmqqasmsimulator) / 8192},

      {π/2 * 0.4, (OneZeroFirst04ibmqqasmsimulator + ZeroZeroFirst04ibmqqasmsimulator) / 8192},

      {π/2 * 0.6, (OneZeroFirst06ibmqqasmsimulator + ZeroZeroFirst06ibmqqasmsimulator) / 8192},

      {π/2 * 0.8, (OneZeroFirst08ibmqqasmsimulator + ZeroZeroFirst08ibmqqasmsimulator) / 8192},

      {π/2 * 1.0, (OneZeroFirst10ibmqqasmsimulator + ZeroZeroFirst10ibmqqasmsimulator) / 8192}}
   ExpCosSqibmqqasmsimulator = ListPlot[CosSqibmqqasmsimulator]
   ExpDecisivenessibmqqasmsimulator = ListPlot[Decisivenessibmqqasmsimulator]
```

Out[●]= 8189

Out[●]= 3

Out[●]= 0

Out[●]= 0

Out[●]= 7970

Out[●]= 3

Out[●]= 1

Out[●]= 218

Out[●]= 7445

Out[●]= 4

Out[●]= 4

Out[●]= 739

Out[●]= 6516

Out[●]= 4

Out[●]= 5

Out[●]= 1667

Out[●]= 5359

Out[●]= 7

Out[●]= 9

Out[●]= 2817

Out[●]= 4082

Out[●]= 1

Out[●]= 17

Out[●]= 4092

Out[●]= 2865

Out[●]= 0

Out[●]= 19

Out[●]= 5308

Out[●]= 1626

Out[●]= 0

Out[●]= 33

Out[●]= 6533

Out[●]= 812

Out[●]= 0

Out[●]= 33

Out[●]= 7347

Out[●]= 218

Out[●]= 0

Out[●]= 45

Out[●]= 7929
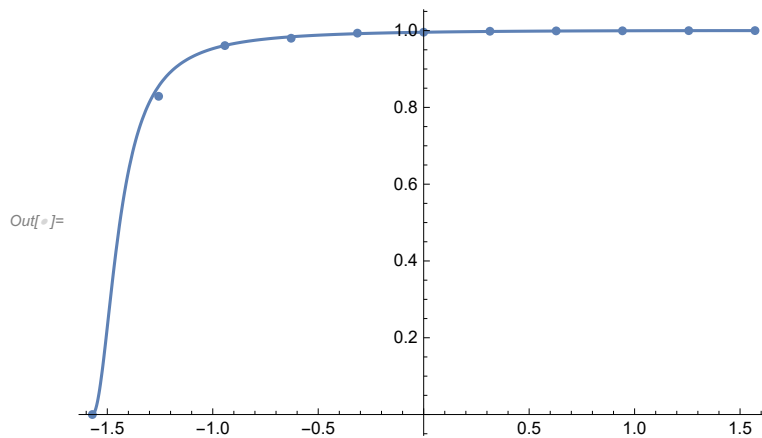
Out[●]= 0

Out[●]= 0

Out[●]= 39

Out[●]= 8153

Out[●]= $\left\{\left\{-\frac{\pi}{2}, 0\right\}, \left\{-1.25664, \frac{218}{263}\right\}, \left\{-0.942478, \frac{812}{845}\right\},\right.$

$\left\{-0.628319, \frac{542}{553}\right\}, \left\{-0.314159, \frac{2865}{2884}\right\}, \left\{0., \frac{4082}{4099}\right\}, \left\{0.314159, \frac{5359}{5368}\right\},$

$\left\{0.628319, \frac{6516}{6521}\right\}, \left\{0.942478, \frac{7445}{7449}\right\}, \left\{1.25664, \frac{7970}{7971}\right\}, \left\{\frac{\pi}{2}, 1\right\}\right\}$

Out[●]= $\left\{\left\{-\frac{\pi}{2}, \frac{39}{8192}\right\}, \left\{-1.25664, \frac{263}{8192}\right\}, \left\{-0.942478, \frac{845}{8192}\right\},\right.$

$\left\{-0.628319, \frac{1659}{8192}\right\}, \left\{-0.314159, \frac{721}{2048}\right\}, \left\{0., \frac{4099}{8192}\right\}, \left\{0.314159, \frac{671}{1024}\right\},$

$\left\{0.628319, \frac{6521}{8192}\right\}, \left\{0.942478, \frac{7449}{8192}\right\}, \left\{1.25664, \frac{7971}{8192}\right\}, \left\{1.5708, \frac{8189}{8192}\right\}\right\}$

Out[●]=

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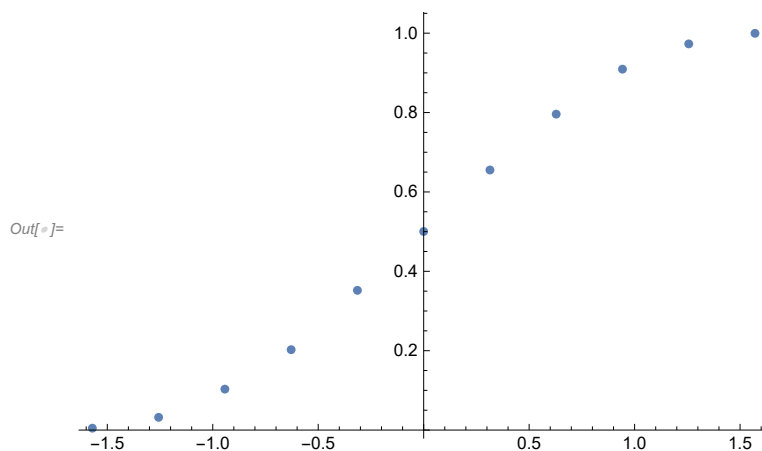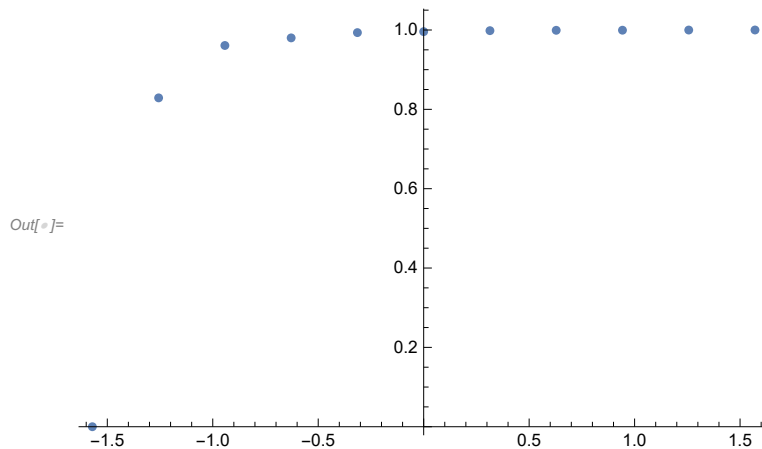
In[ ]:= **Show[cosTH, ExpCosSqibmqqasmsimulator]**

Out[ ]=

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

Out[ ]=
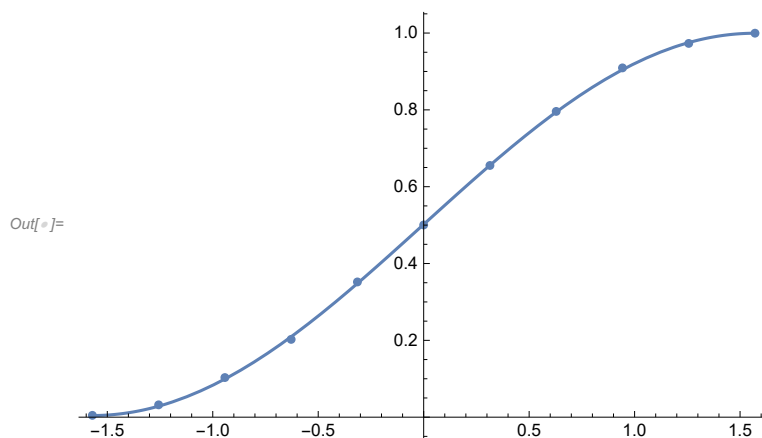
In[ ]:= **(*ibmq_belem*)**
ZeroZeroFirst10ibmqbelem = 7390
ZeroOneFirst10ibmqbelem = 220
OneZeroFirst10ibmqbelem = 284
OneOneFirst10ibmqbelem = 298

ZeroZeroFirst08ibmqbelem = 7126
ZeroOneFirst08ibmqbelem = 247
OneZeroFirst08ibmqbelem = 268
OneOneFirst08ibmqbelem = 551

ZeroZeroFirst06ibmqbelem = 6534
ZeroOneFirst06ibmqbelem = 293
OneZeroFirst06ibmqbelem = 279
OneOneFirst06ibmqbelem = 1086

ZeroZeroFirst04ibmqbelem = 5733
ZeroOneFirst04ibmqbelem = 298
OneZeroFirst04ibmqbelem = 321
OneOneFirst04ibmqbelem = 1840

```
ZeroZeroFirst02ibmqbelem = 4768
ZeroOneFirst02ibmqbelem = 312
OneZeroFirst02ibmqbelem = 342
OneOneFirst02ibmqbelem = 2770

ZeroZeroFirst00ibmqbelem = 3720
ZeroOneFirst00ibmqbelem = 370
OneZeroFirst00ibmqbelem = 398
OneOneFirst00ibmqbelem = 3704

ZeroZeroSecond02ibmqbelem = 2526
ZeroOneSecond02ibmqbelem = 413
OneZeroSecond02ibmqbelem = 453
OneOneSecond02ibmqbelem = 4800

ZeroZeroSecond04ibmqbelem = 1639
ZeroOneSecond04ibmqbelem = 381
OneZeroSecond04ibmqbelem = 465
OneOneSecond04ibmqbelem = 5707

ZeroZeroSecond06ibmqbelem = 845
ZeroOneSecond06ibmqbelem = 414
OneZeroSecond06ibmqbelem = 485
OneOneSecond06ibmqbelem = 6448

ZeroZeroSecond08ibmqbelem = 463
ZeroOneSecond08ibmqbelem = 427
OneZeroSecond08ibmqbelem = 561
OneOneSecond08ibmqbelem = 6741

ZeroZeroSecond10ibmqbelem = 356
ZeroOneSecond10ibmqbelem = 436
OneZeroSecond10ibmqbelem = 547
OneOneSecond10ibmqbelem = 6853
```

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

```mathematica
  {π/2 * 0.2, ZeroZeroFirst02ibmqbelem /

    (OneZeroFirst02ibmqbelem + ZeroZeroFirst02ibmqbelem)}, {π/2 * 0.4,

   ZeroZeroFirst04ibmqbelem / (OneZeroFirst04ibmqbelem + ZeroZeroFirst04ibmqbelem)},

  {π/2 * 0.6, ZeroZeroFirst06ibmqbelem /

    (OneZeroFirst06ibmqbelem + ZeroZeroFirst06ibmqbelem)}, {π/2 * 0.8,

   ZeroZeroFirst08ibmqbelem / (OneZeroFirst08ibmqbelem + ZeroZeroFirst08ibmqbelem)},

  {π/2 * 1, ZeroZeroFirst10ibmqbelem / (OneZeroFirst10ibmqbelem + ZeroZeroFirst10ibmqbelem)}}
Decisivenessibmqbelem =
 {{-π/2 * 1, (OneZeroSecond10ibmqbelem + ZeroZeroSecond10ibmqbelem) / 8192},

  {-π/2 * 0.8, (OneZeroSecond08ibmqbelem + ZeroZeroSecond08ibmqbelem) / 8192},

  {-π/2 * 0.6, (OneZeroSecond06ibmqbelem + ZeroZeroSecond06ibmqbelem) / 8192},

  {-π/2 * 0.4, (OneZeroSecond04ibmqbelem + ZeroZeroSecond04ibmqbelem) / 8192},

  {-π/2 * 0.2, (OneZeroSecond02ibmqbelem + ZeroZeroSecond02ibmqbelem) / 8192},

  {-π/2 * 0.0, (OneZeroFirst00ibmqbelem + ZeroZeroFirst00ibmqbelem) / 8192},

  {π/2 * 0.2, (OneZeroFirst02ibmqbelem + ZeroZeroFirst02ibmqbelem) / 8192},

  {π/2 * 0.4, (OneZeroFirst04ibmqbelem + ZeroZeroFirst04ibmqbelem) / 8192},

  {π/2 * 0.6, (OneZeroFirst06ibmqbelem + ZeroZeroFirst06ibmqbelem) / 8192},

  {π/2 * 0.8, (OneZeroFirst08ibmqbelem + ZeroZeroFirst08ibmqbelem) / 8192},

  {π/2 * 1.0, (OneZeroFirst10ibmqbelem + ZeroZeroFirst10ibmqbelem) / 8192}}
ExpCosSqibmqbelem = ListPlot[CosSqibmqbelem]
ExpDecisivenessibmqbelem = ListPlot[Decisivenessibmqbelem]
```

Out[•]= 7390

Out[•]= 220

Out[•]= 284

Out[•]= 298

Out[•]= 7126

Out[•]= 247

Out[•]= 268

Out[•]= 551

Out[•]= 6534

Out[•]= 293

Out[•]= 279

Out[•]= 1086

Out[•]= 5733

Out[•]= 298

Out[•]= 321

Out[•]= 1840

Out[•]= 4768

Out[•]= 312

Out[•]= 342

Out[•]= 2770

Out[•]= 3720

Out[•]= 370

Out[•]= 398

Out[•]= 3704

Out[•]= 2526

Out[•]= 413

Out[•]= 453

Out[•]= 4800

Out[•]= 1639

Out[•]= 381

Out[•]= 465

Out[•]= 5707

Out[•]= 845

Out[•]= 414

Out[•]= 485

Out[•]= 6448

Out[•]= 463

Out[•]= 427

Out[•]= 561

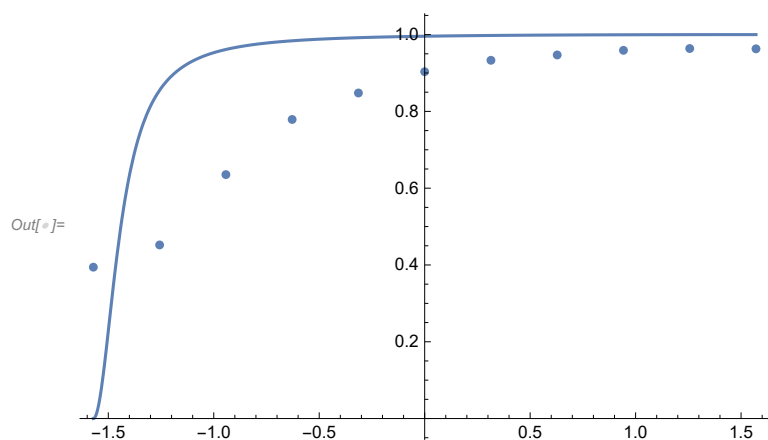*Out[ ]=* 6741

Out[ ]= 356

Out[ ]= 436

Out[ ]= 547

Out[ ]= 6853

Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{356}{903}\right\}, \left\{-1.25664, \frac{463}{1024}\right\}, \left\{-0.942478, \frac{169}{266}\right\}, \right.$
$\left\{-0.628319, \frac{1639}{2104}\right\}, \left\{-0.314159, \frac{842}{993}\right\}, \left\{0., \frac{1860}{2059}\right\}, \left\{0.314159, \frac{2384}{2555}\right\}, \right.$
$\left\{0.628319, \frac{1911}{2018}\right\}, \left\{0.942478, \frac{726}{757}\right\}, \left\{1.25664, \frac{3563}{3697}\right\}, \left\{\frac{\pi}{2}, \frac{3695}{3837}\right\}\right\}$
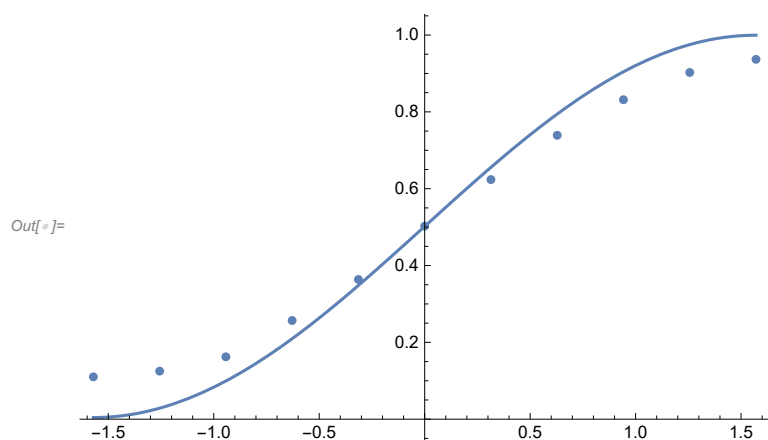
Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{903}{8192}\right\}, \left\{-1.25664, \frac{1}{8}\right\}, \left\{-0.942478, \frac{665}{4096}\right\}, \right.$
$\left\{-0.628319, \frac{263}{1024}\right\}, \left\{-0.314159, \frac{2979}{8192}\right\}, \left\{0., \frac{2059}{4096}\right\}, \left\{0.314159, \frac{2555}{4096}\right\}, \right.$
$\left\{0.628319, \frac{3027}{4096}\right\}, \left\{0.942478, \frac{6813}{8192}\right\}, \left\{1.25664, \frac{3697}{4096}\right\}, \left\{1.5708, \frac{3837}{4096}\right\}\right\}$

Out[ ]=

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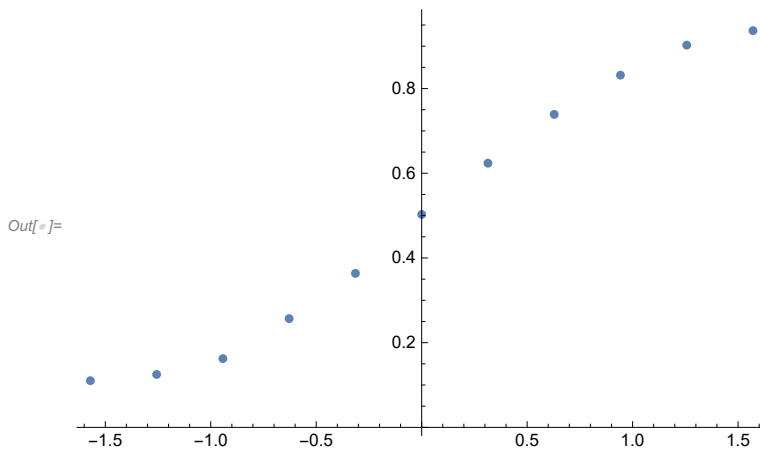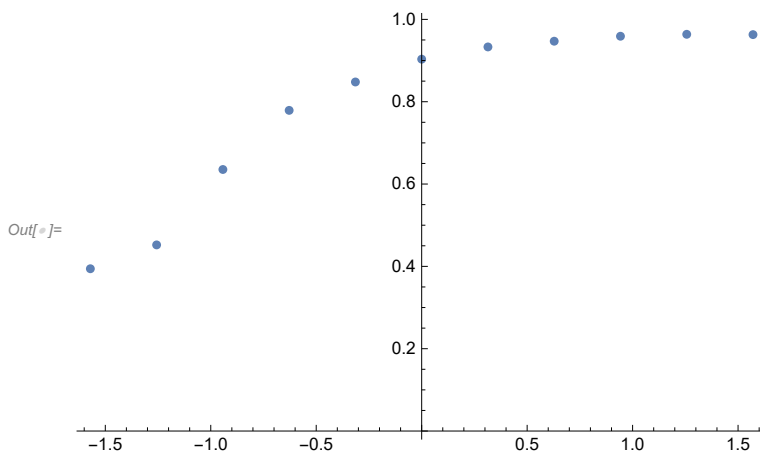
In[ ]:= **Show[cosTH, ExpCosSqibmqbelem]**

Out[ ]=

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

Out[ ]=

In[ ]:=

In[ ]:= **{"○", "△", "⋆", "◇", "□", "▽", "⊕", "⊙"}**

Out[ ]= {○, △, ⋆, ◇, □, ▽, ⊕, ⊙}

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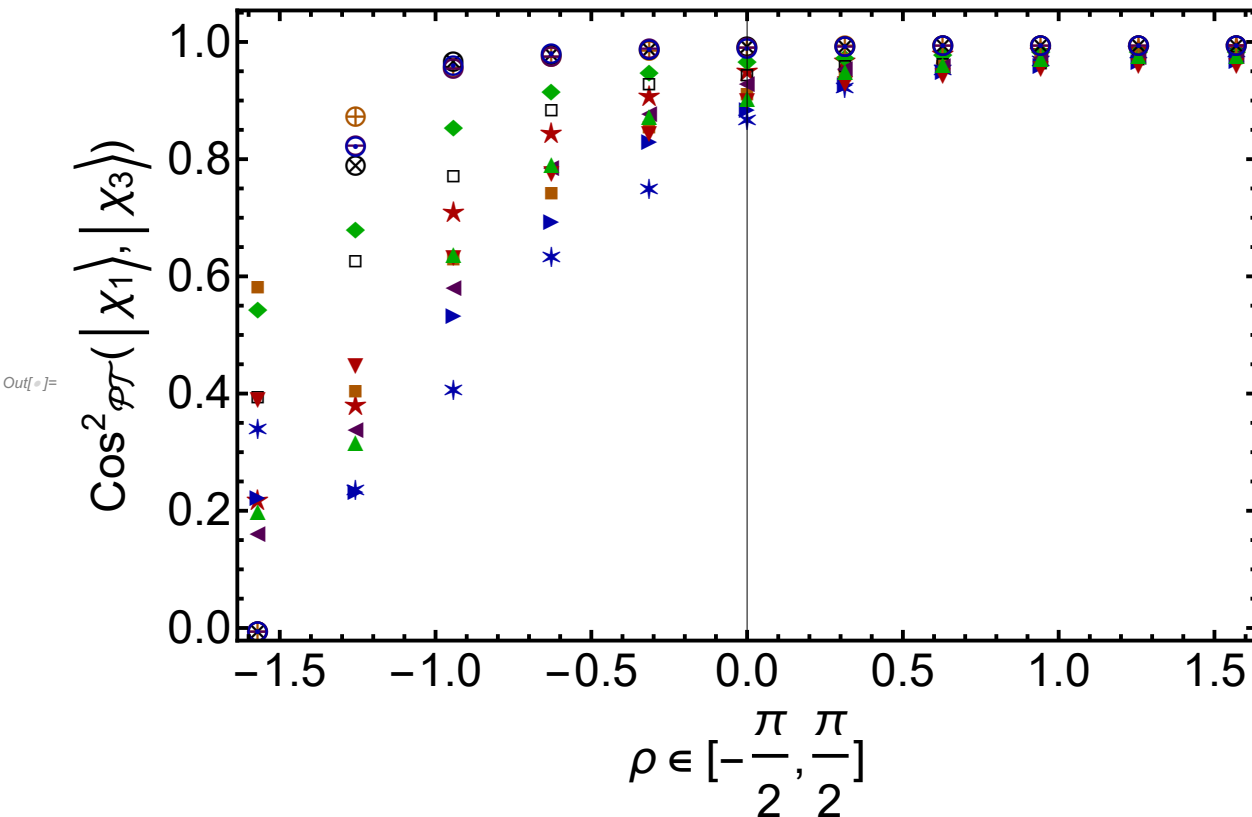   **ResourceFunction["PolygonMarker"][name, Offset[size], EdgeForm[]];**

In[ ]:= **Subscript[Cos², $\mathcal{PT}$]**

Out[ ]= $\text{Cos}^2{}_{\mathcal{PT}}$

In[ ]:= `CosSqExperiment =`
`ListPlot[{CosSqibmperth, CosSqibmqjakarta, CosSqibmlagos, CosSqibmnairobi, CosSqibmoslo,`
`  CosSqibmqmanila, CosSqibmqquito, CosSqibmqbelem, CosSqibmqlima, CosSqsimulatormps,`
`  CosSqsimulatorextendedstabilizer, CosSqibmqqasmsimulator, CosSqsimulatorstatevector},`
`PlotStyle → {Directive[Darker[Blue], Thickness[0.007]],`
`  Directive[Darker[Red], Dashing[0.02], Thickness[0.007]],`
`  Directive[Darker[Green], Thickness[0.005], Dotted],`
`  Directive[Darker[Orange], Thickness[0.007], Dashed], Directive[Darker[Black],`
`   Thickness[0.003]], Directive[Cross, Darker[Purple], Thickness[0.003]]},`
`Frame → True, FrameStyle → Directive[Black, Thick], Frame → True,`
`FrameStyle → Directive[Black, Thick], LabelStyle → Large,`
`PlotStyle → {Directive[Darker[Green], Thickness[0.007]]},`
`FrameLabel → {{"Cos²`$_{\mathcal{PT}}$`(|χ₁⟩,|χ₃⟩)",}, {"ρ ∈ [-`$\frac{\pi}{2}$`,`$\frac{\pi}{2}$`]", ""}},`
`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}}]`

Out[ ]=

In[ ]:= `x / (x + y)`

Out[ ]= $\frac{x}{x + y}$

In[ ]:= $\dfrac{\langle \psi_{\mathcal{PT}} \, | \, \psi_{\mathcal{PT}} \rangle}{\langle \psi_{\mathcal{PT}} \, | \, \psi_{\mathcal{PT}} \rangle + \langle \psi_{\mathcal{PT}} \, | \, \xi^2 \, | \, \psi_{\mathcal{PT}} \rangle}$

In[ ]:=

In[ ]:= **x^2**

Out[ ]= x^2

In[ ]:= ξ^2

Out[ ]= ζ^2

In[ ]:= $\langle \psi_{\mathcal{PT}} \, | \, \psi_{\mathcal{PT}} \rangle \, / \, (\langle \psi_{\mathcal{PT}} \, | \, \psi_{\mathcal{PT}} \rangle + \langle \psi_{\mathcal{PT}} \, | \, \xi^2 \, | \, \psi_{\mathcal{PT}} \rangle)$

In[ ]:= **CosSqTheory = Plot[cos13F[π/2 - 0.5, π/2, x], {x, -π/2, π/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 → {{"Cos²$_{\mathcal{PT}}$($|\chi_1\rangle$, $|\chi_3\rangle$) [ρ]",}, {"ρ ∈ [-$\dfrac{\pi}{2}$, $\dfrac{\pi}{2}$]", ""}},**
**   LabelStyle → {FontWeight → "Bold", FontSize → 25},**
**   ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]**

Out[ ]=

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

Out[ ]=
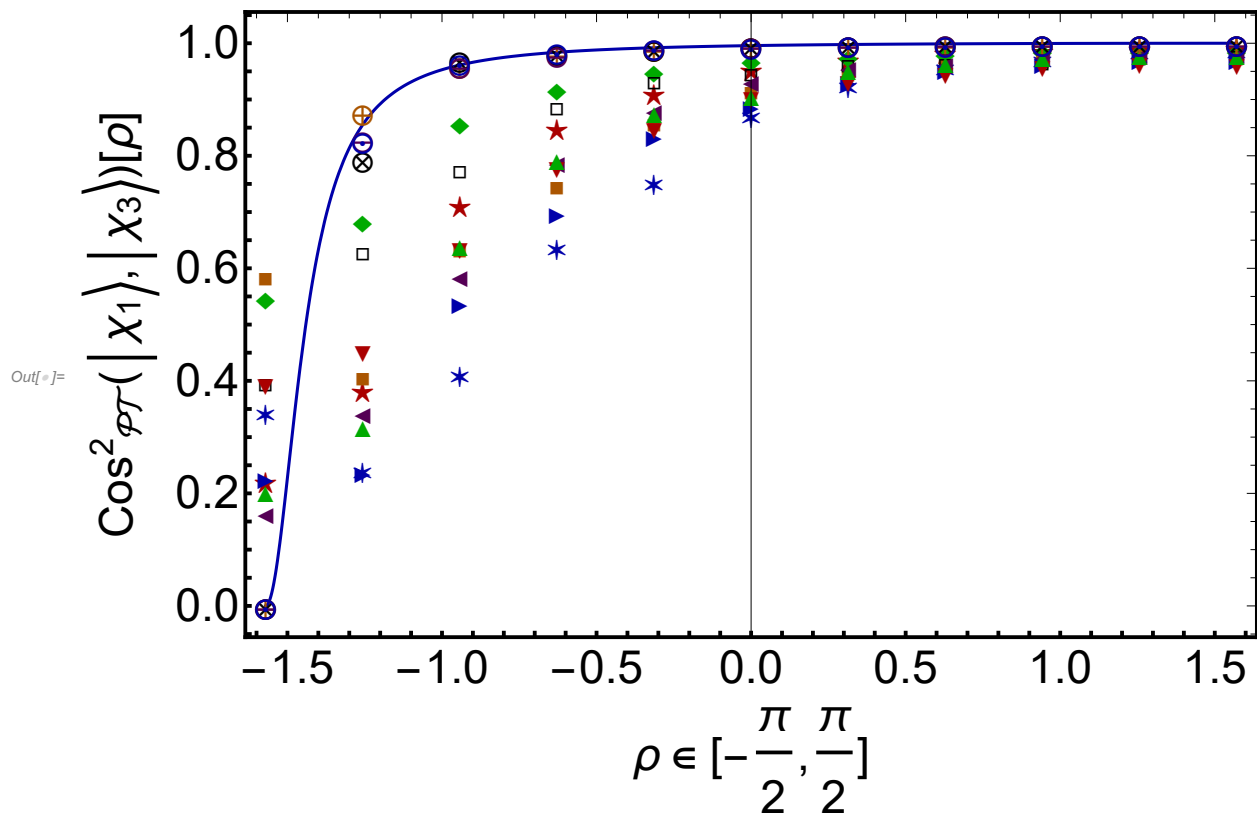
In[ ]:=

```
In[ ]:= DecisivenessTheory = Plot[DecisiveProbability[15.345, π/2 - 0.5, π/2, x], {x, -π/2, π/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]]},
```

$$\text{FrameLabel} \to \left\{\left\{\text{"}\frac{\langle \psi_{\mathcal{PT}} \mid \psi_{\mathcal{PT}} \rangle}{\langle \psi_{\mathcal{PT}} \mid \psi_{\mathcal{PT}} \rangle + \langle \psi_{\mathcal{PT}} \mid \zeta^2 \mid \psi_{\mathcal{PT}} \rangle}\text{"},\right\}, \left\{\text{"}\rho \in [-\frac{\pi}{2}, \frac{\pi}{2}]\text{"}, \text{""}\right\}\right\},$$

```
        LabelStyle → {FontWeight → "Bold", FontSize → 25},
        ImageSize → 650, GridLinesStyle → Directive[Thick, Gray]]
```

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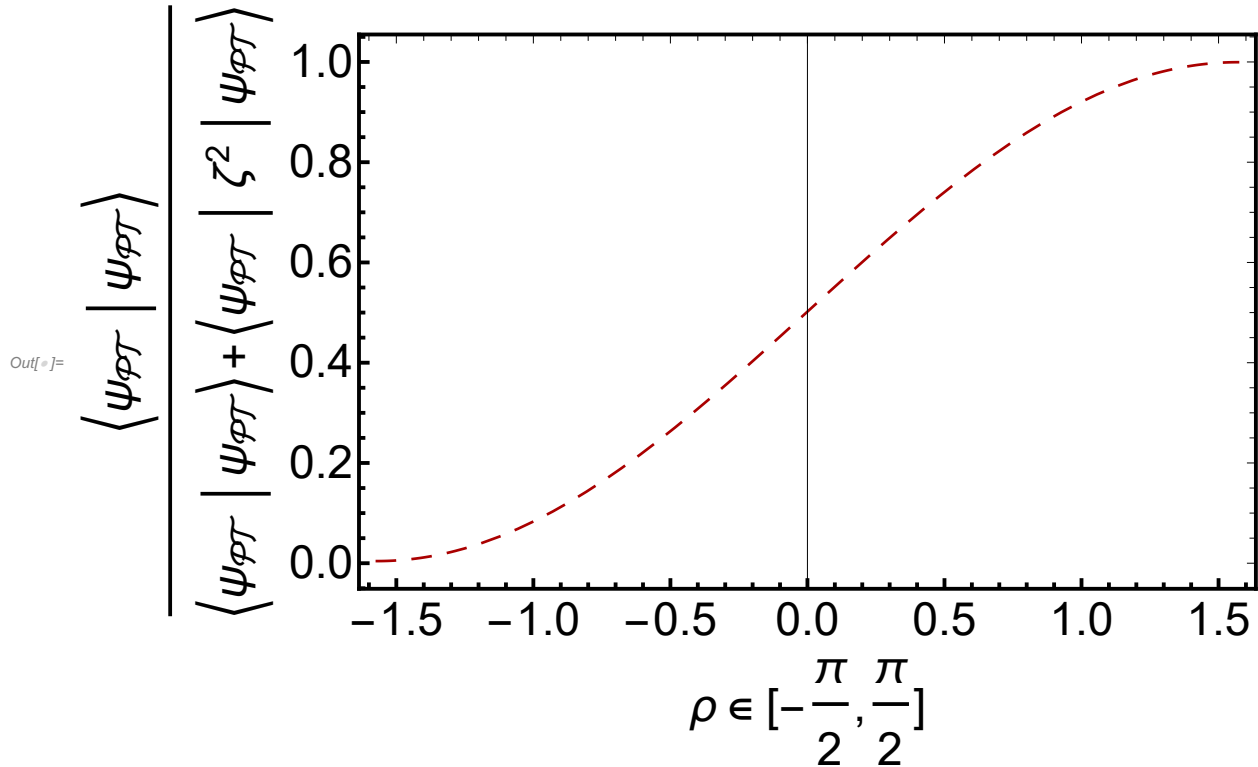`  ListPlot[{Decisivenessibmperth, Decisivenessibmqjakarta, Decisivenessibmlagos,`
`    Decisivenessibmnairobi, Decisivenessibmoslo, Decisivenessibmqmanila,`
`    Decisivenessibmqquito, Decisivenessibmqbelem, Decisivenessibmqlima,`
`    Decisivenesssimulatormps, Decisivenesssimulatorextendedstabilizer,`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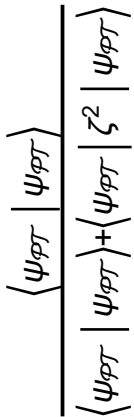`   FrameLabel → {{"`$\frac{\langle \psi_{\mathcal{PT}} \mid \psi_{\mathcal{PT}} \rangle}{\langle \psi_{\mathcal{PT}} \mid \psi_{\mathcal{PT}} \rangle + \langle \psi_{\mathcal{PT}} \mid \xi^2 \mid \psi_{\mathcal{PT}} \rangle}$`",}, {"`$\rho \in [-\frac{\pi}{2}, \frac{\pi}{2}]$`", ""}},`
`   LabelStyle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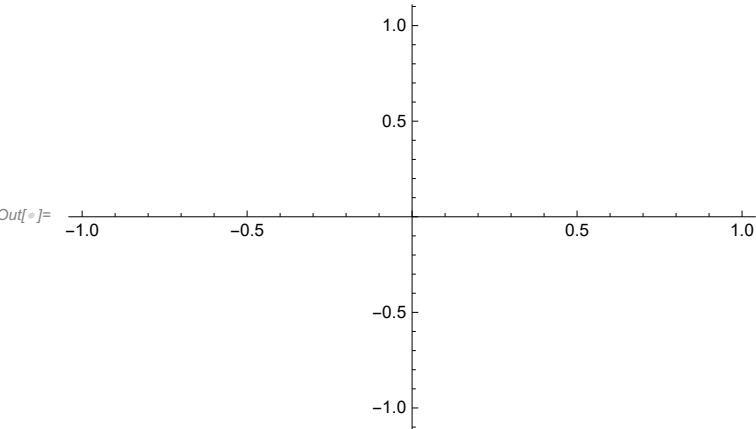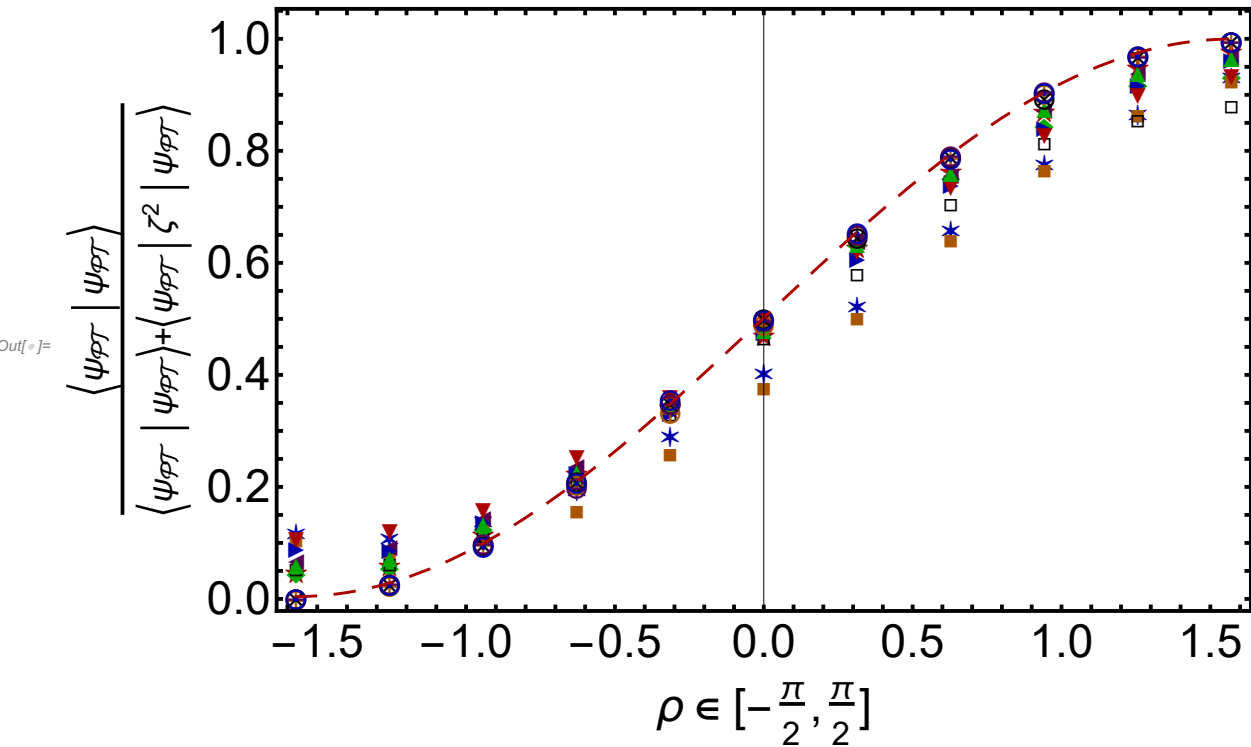`   PlotMarkers -> {{"★", 15}, {"☆", 15}, {"◆", 15}, {"■", 15}, {"□", 15}, {"◄", 15},`
`     {"►", 15}, {"▼", 15}, {"▲", 15}, {"⊕", 15}, {"⊗", 15}, {"⊖", 15}, {"⊙", 15}}]`

Out[ ]=

In[∘]:= `""`

Out[∘]=

In[∘]:= `ListPlot[{testData1, testData2, testData3}, PlotMarkers -> {{●, 10}, {▲, 10}, {■, 10}}]`

Out[∘]=

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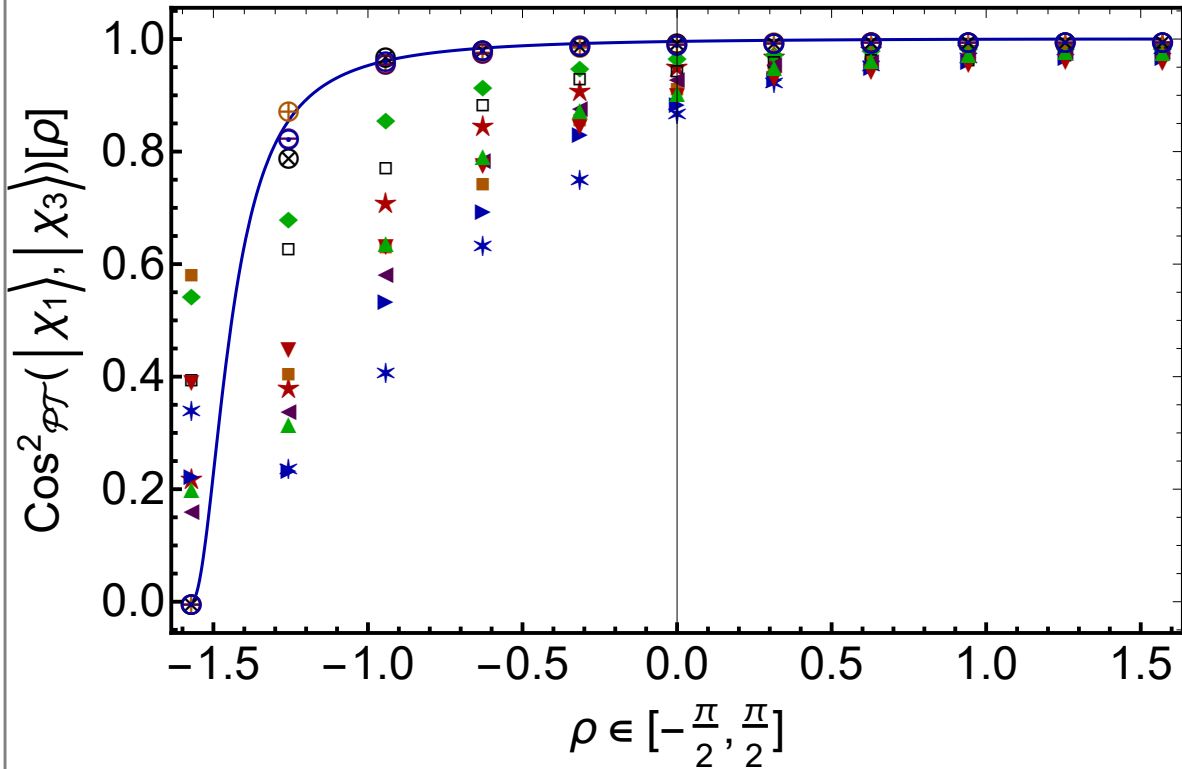
Out[∘]=

In[∘]:= $\pi / 2 - 1$

Out[∘]= $-1 + \dfrac{\pi}{2}$

In[ ]:= `title = Panel[Style["Second stage, α = `$\frac{\pi}{2}$` - 0.5, `$\mathcal{N}(0) \approx \mathcal{N}_{min}$`", White, 20],`

   `ImageSize → 500, Background → Blue, Alignment → Center];`
`DependenceVariation = Deploy@Grid[{{title, SpanFromLeft}, {p1, p2}},`
   `Dividers → Gray, Spacings → {0, 0}]`

Out[ ]=

In[ ]:= `Export["M05Exp_8_12_2023.png", DependenceVariation, ImageSize → 10000]`

Out[ ]= `M05Exp_8_12_2023.png`

In[ ]:= `(*ibm_perth*)`
`ZeroZeroFirst10ibmperth = 7500`
`ZeroOneFirst10ibmperth = 265`
`OneZeroFirst10ibmperth = 127`
`OneOneFirst10ibmperth = 300`

`ZeroZeroFirst08ibmperth = 6952`
`ZeroOneFirst08ibmperth = 276`
`OneZeroFirst08ibmperth = 129`
`OneOneFirst08ibmperth = 835`

`ZeroZeroFirst06ibmperth = 6160`
`ZeroOneFirst06ibmperth = 326`

```
OneZeroFirst06ibmperth = 202
OneOneFirst06ibmperth = 1504

ZeroZeroFirst04ibmperth = 5136
ZeroOneFirst04ibmperth = 363
OneZeroFirst04ibmperth = 253
OneOneFirst04ibmperth = 2440

ZeroZeroFirst02ibmperth = 3953
ZeroOneFirst02ibmperth = 431
OneZeroFirst02ibmperth = 333
OneOneFirst02ibmperth = 3475

ZeroZeroFirst00ibmperth = 2865
ZeroOneFirst00ibmperth = 466
OneZeroFirst00ibmperth = 436
OneOneFirst00ibmperth = 4425

ZeroZeroSecond02ibmperth = 1779
ZeroOneSecond02ibmperth = 431
OneZeroSecond02ibmperth = 593
OneOneSecond02ibmperth = 5389

ZeroZeroSecond04ibmperth = 1004
ZeroOneSecond04ibmperth = 408
OneZeroSecond04ibmperth = 579
OneOneSecond04ibmperth = 6201

ZeroZeroSecond06ibmperth = 461
ZeroOneSecond06ibmperth = 398
OneZeroSecond06ibmperth = 670
OneOneSecond06ibmperth = 6663

ZeroZeroSecond08ibmperth = 209
ZeroOneSecond08ibmperth = 308
OneZeroSecond08ibmperth = 674
OneOneSecond08ibmperth = 7001

ZeroZeroSecond10ibmperth = 328
ZeroOneSecond10ibmperth = 308
OneZeroSecond10ibmperth = 635
OneOneSecond10ibmperth = 6921
```

CosSqibmperth =

$$\Big\{\Big\{-\frac{\pi}{2}*1, \text{ZeroZeroSecond10ibmperth} \Big/ (\text{OneZeroSecond10ibmperth} + \text{ZeroZeroSecond10ibmperth})\Big\},$$

$$\Big\{-\frac{\pi}{2}*0.8, \text{ZeroZeroSecond08ibmperth} \Big/$$

$$(\text{OneZeroSecond08ibmperth} + \text{ZeroZeroSecond08ibmperth})\Big\}, \Big\{-\frac{\pi}{2}*0.6,$$

$$\text{ZeroZeroSecond06ibmperth} \Big/ (\text{OneZeroSecond06ibmperth} + \text{ZeroZeroSecond06ibmperth})\Big\},$$

```
    {- π/2 * 0.4, ZeroZeroSecond04ibmperth /

      (OneZeroSecond04ibmperth + ZeroZeroSecond04ibmperth)}, {- π/2 * 0.2,

      ZeroZeroSecond02ibmperth / (OneZeroSecond02ibmperth + ZeroZeroSecond02ibmperth)},

    {π/2 * 0.0, ZeroZeroFirst00ibmperth / (OneZeroFirst00ibmperth + ZeroZeroFirst00ibmperth)},

    {π/2 * 0.2, ZeroZeroFirst02ibmperth / (OneZeroFirst02ibmperth + ZeroZeroFirst02ibmperth)},

    {π/2 * 0.4, ZeroZeroFirst04ibmperth / (OneZeroFirst04ibmperth + ZeroZeroFirst04ibmperth)},

    {π/2 * 0.6, ZeroZeroFirst06ibmperth / (OneZeroFirst06ibmperth + ZeroZeroFirst06ibmperth)},

    {π/2 * 0.8, ZeroZeroFirst08ibmperth / (OneZeroFirst08ibmperth + ZeroZeroFirst08ibmperth)},

    {π/2 * 1, ZeroZeroFirst10ibmperth / (OneZeroFirst10ibmperth + ZeroZeroFirst10ibmperth)}}
Decisivenessibmperth =
  {{- π/2 * 1, (OneZeroSecond10ibmperth + ZeroZeroSecond10ibmperth) / 8192},

   {- π/2 * 0.8, (OneZeroSecond08ibmperth + ZeroZeroSecond08ibmperth) / 8192},

   {- π/2 * 0.6, (OneZeroSecond06ibmperth + ZeroZeroSecond06ibmperth) / 8192},

   {- π/2 * 0.4, (OneZeroSecond04ibmperth + ZeroZeroSecond04ibmperth) / 8192},

   {- π/2 * 0.2, (OneZeroSecond02ibmperth + ZeroZeroSecond02ibmperth) / 8192},

   {- π/2 * 0.0, (OneZeroFirst00ibmperth + ZeroZeroFirst00ibmperth) / 8192},

   {π/2 * 0.2, (OneZeroFirst02ibmperth + ZeroZeroFirst02ibmperth) / 8192},

   {π/2 * 0.4, (OneZeroFirst04ibmperth + ZeroZeroFirst04ibmperth) / 8192},

   {π/2 * 0.6, (OneZeroFirst06ibmperth + ZeroZeroFirst06ibmperth) / 8192},

   {π/2 * 0.8, (OneZeroFirst08ibmperth + ZeroZeroFirst08ibmperth) / 8192},

   {π/2 * 1.0, (OneZeroFirst10ibmperth + ZeroZeroFirst10ibmperth) / 8192}}
ExpCosSqibmperth = ListPlot[CosSqibmperth]
ExpDecisivenessibmperth = ListPlot[Decisivenessibmperth]
Show[cosTH, ExpCosSqibmperth]
Show[decTH, ExpDecisivenessibmperth]
```

Out[ ]= 7500

Out[ ]= 265

Out[ ]= 127

Out[ ]= 300

Out[ ]= 6952

Out[ ]= 276

Out[ ]= 129

Out[ ]= 835

Out[ ]= 6160

Out[ ]= 326

Out[ ]= 202

Out[ ]= 1504

Out[ ]= 5136

Out[ ]= 363

Out[ ]= 253

Out[ ]= 2440

Out[ ]= 3953

Out[ ]= 431

Out[ ]= 333

Out[ ]= 3475

Out[ ]= 2865

Out[ ]= 466

Out[ ]= 436

Out[ ]= 4425

Out[ ]= 1779

Out[ ]= 431

Out[ ]= 593

Out[ ]= 5389

Out[ ]= 1004

Out[ ]= 408

Out[ ]= 579

Out[ ]= 6201

Out[ ]= 461

Out[ ]= 398

Out[ ]= 670

Out[●]= 6663

Out[●]= 209

Out[●]= 308

Out[●]= 674

Out[●]= 7001

Out[●]= 328

Out[●]= 308

Out[●]= 635

Out[●]= 6921

Out[●]= $\left\{\left\{-\frac{\pi}{2}, \frac{328}{963}\right\}, \left\{-1.25664, \frac{209}{883}\right\}, \left\{-0.942478, \frac{461}{1131}\right\}, \right.$
$\left\{-0.628319, \frac{1004}{1583}\right\}, \left\{-0.314159, \frac{3}{4}\right\}, \left\{0., \frac{2865}{3301}\right\}, \left\{0.314159, \frac{3953}{4286}\right\},$
$\left\{0.628319, \frac{5136}{5389}\right\}, \left\{0.942478, \frac{3080}{3181}\right\}, \left\{1.25664, \frac{6952}{7081}\right\}, \left\{\frac{\pi}{2}, \frac{7500}{7627}\right\}\right\}$

Out[●]= $\left\{\left\{-\frac{\pi}{2}, \frac{963}{8192}\right\}, \left\{-1.25664, \frac{883}{8192}\right\}, \left\{-0.942478, \frac{1131}{8192}\right\}, \right.$
$\left\{-0.628319, \frac{1583}{8192}\right\}, \left\{-0.314159, \frac{593}{2048}\right\}, \left\{0., \frac{3301}{8192}\right\}, \left\{0.314159, \frac{2143}{4096}\right\},$
$\left\{0.628319, \frac{5389}{8192}\right\}, \left\{0.942478, \frac{3181}{4096}\right\}, \left\{1.25664, \frac{7081}{8192}\right\}, \left\{1.5708, \frac{7627}{8192}\right\}\right\}$

Out[●]=

Out[ ]=

Out[ ]=

Out[ ]=
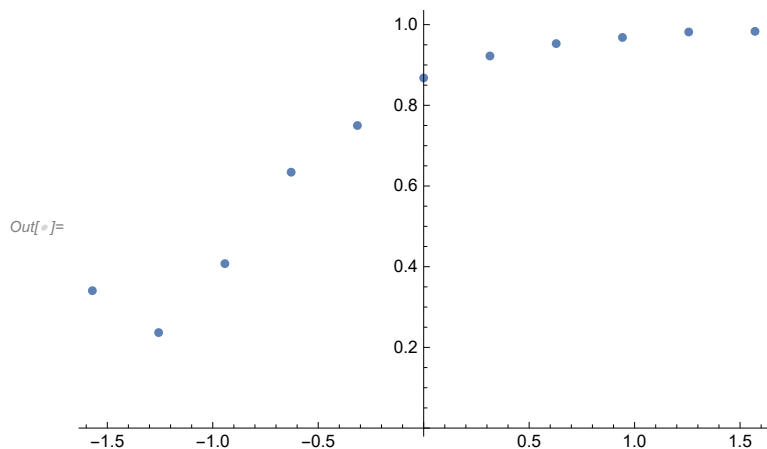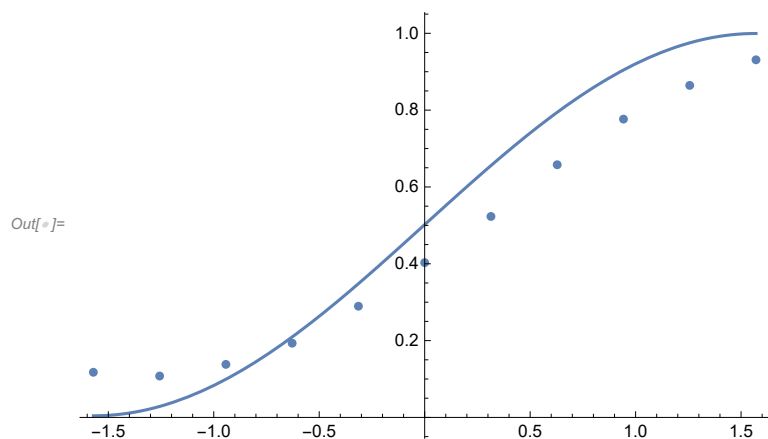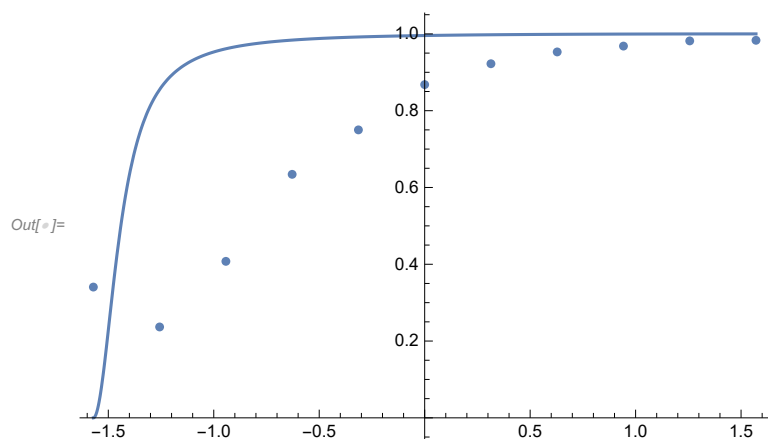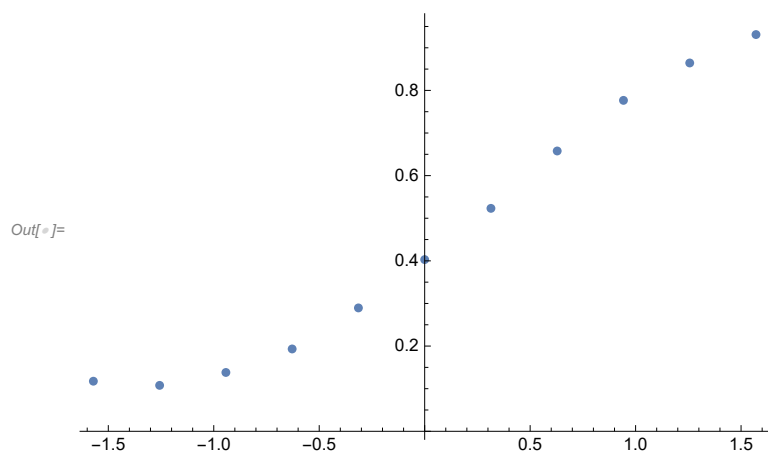
In[ ]:= **(*ibmq_jakarta*)**
ZeroZeroFirst10ibmqjakarta = 7939
ZeroOneFirst10ibmqjakarta = 111
OneZeroFirst10ibmqjakarta = 66
OneOneFirst10ibmqjakarta = 76

ZeroZeroFirst08ibmqjakarta = 7700
ZeroOneFirst08ibmqjakarta = 112
OneZeroFirst08ibmqjakarta = 79
OneOneFirst08ibmqjakarta = 301

```
ZeroZeroFirst06ibmqjakarta = 7026
ZeroOneFirst06ibmqjakarta = 132
OneZeroFirst06ibmqjakarta = 104
OneOneFirst06ibmqjakarta = 930


ZeroZeroFirst04ibmqjakarta = 6134
ZeroOneFirst04ibmqjakarta = 170
OneZeroFirst04ibmqjakarta = 117
OneOneFirst04ibmqjakarta = 1771


ZeroZeroFirst02ibmqjakarta = 4990
ZeroOneFirst02ibmqjakarta = 214
OneZeroFirst02ibmqjakarta = 158
OneOneFirst02ibmqjakarta = 2830


ZeroZeroFirst00ibmqjakarta = 3670
ZeroOneFirst00ibmqjakarta = 244
OneZeroFirst00ibmqjakarta = 186
OneOneFirst00ibmqjakarta = 4092


ZeroZeroSecond02ibmqjakarta = 2550
ZeroOneSecond02ibmqjakarta = 232
OneZeroSecond02ibmqjakarta = 254
OneOneSecond02ibmqjakarta = 5156


ZeroZeroSecond04ibmqjakarta = 1558
ZeroOneSecond04ibmqjakarta = 308
OneZeroSecond04ibmqjakarta = 283
OneOneSecond04ibmqjakarta = 6043


ZeroZeroSecond06ibmqjakarta = 675
ZeroOneSecond06ibmqjakarta = 307
OneZeroSecond06ibmqjakarta = 275
OneOneSecond06ibmqjakarta = 6935


ZeroZeroSecond08ibmqjakarta = 187
ZeroOneSecond08ibmqjakarta = 309
OneZeroSecond08ibmqjakarta = 303
OneOneSecond08ibmqjakarta = 7393


ZeroZeroSecond10ibmqjakarta = 84
ZeroOneSecond10ibmqjakarta = 287
OneZeroSecond10ibmqjakarta = 299
OneOneSecond10ibmqjakarta = 7522
```

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

```
      (OneZeroSecond08ibmqjakarta + ZeroZeroSecond08ibmqjakarta)},
   {- π/2 * 0.6, ZeroZeroSecond06ibmqjakarta /

      (OneZeroSecond06ibmqjakarta + ZeroZeroSecond06ibmqjakarta)},
   {- π/2 * 0.4, ZeroZeroSecond04ibmqjakarta /

      (OneZeroSecond04ibmqjakarta + ZeroZeroSecond04ibmqjakarta)},
   {- π/2 * 0.2, ZeroZeroSecond02ibmqjakarta /

      (OneZeroSecond02ibmqjakarta + ZeroZeroSecond02ibmqjakarta)}, {π/2 * 0.0,

    ZeroZeroFirst00ibmqjakarta / (OneZeroFirst00ibmqjakarta + ZeroZeroFirst00ibmqjakarta)},
   {π/2 * 0.2, ZeroZeroFirst02ibmqjakarta /

      (OneZeroFirst02ibmqjakarta + ZeroZeroFirst02ibmqjakarta)}, {π/2 * 0.4,

    ZeroZeroFirst04ibmqjakarta / (OneZeroFirst04ibmqjakarta + ZeroZeroFirst04ibmqjakarta)},
   {π/2 * 0.6, ZeroZeroFirst06ibmqjakarta /

      (OneZeroFirst06ibmqjakarta + ZeroZeroFirst06ibmqjakarta)}, {π/2 * 0.8,

    ZeroZeroFirst08ibmqjakarta / (OneZeroFirst08ibmqjakarta + ZeroZeroFirst08ibmqjakarta)},
   {π/2 * 1, ZeroZeroFirst10ibmqjakarta /

      (OneZeroFirst10ibmqjakarta + ZeroZeroFirst10ibmqjakarta)}}}
Decisivenessibmqjakarta = {{- π/2 * 1,

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

Show[decTH, ExpDecisivenessibmqjakarta]

Out[●]= 7939

Out[●]= 111

Out[●]= 66

Out[●]= 76

Out[●]= 7700

Out[●]= 112

Out[●]= 79

Out[●]= 301

Out[●]= 7026

Out[●]= 132

Out[●]= 104

Out[●]= 930

Out[●]= 6134

Out[●]= 170

Out[●]= 117

Out[●]= 1771

Out[●]= 4990

Out[●]= 214

Out[●]= 158

Out[●]= 2830

Out[●]= 3670

Out[●]= 244

Out[●]= 186

Out[●]= 4092

Out[●]= 2550

Out[●]= 232

Out[●]= 254

Out[●]= 5156

Out[●]= 1558

Out[●]= 308

Out[ ]= 283

Out[ ]= 6043

Out[ ]= 675

Out[ ]= 307

Out[ ]= 275

Out[ ]= 6935

Out[ ]= 187

Out[ ]= 309

Out[ ]= 303

Out[ ]= 7393

Out[ ]= 84

Out[ ]= 287

Out[ ]= 299

Out[ ]= 7522

Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{84}{383}\right\}, \left\{-1.25664, \frac{187}{490}\right\}, \left\{-0.942478, \frac{27}{38}\right\},\right.$
$\left\{-0.628319, \frac{1558}{1841}\right\}, \left\{-0.314159, \frac{1275}{1402}\right\}, \left\{0., \frac{1835}{1928}\right\}, \left\{0.314159, \frac{2495}{2574}\right\},\right.$
$\left\{0.628319, \frac{6134}{6251}\right\}, \left\{0.942478, \frac{3513}{3565}\right\}, \left\{1.25664, \frac{7700}{7779}\right\}, \left\{\frac{\pi}{2}, \frac{7939}{8005}\right\}\right\}$

Out[ ]= $\left\{\left\{-\frac{\pi}{2}, \frac{383}{8192}\right\}, \left\{-1.25664, \frac{245}{4096}\right\}, \left\{-0.942478, \frac{475}{4096}\right\},\right.$
$\left\{-0.628319, \frac{1841}{8192}\right\}, \left\{-0.314159, \frac{701}{2048}\right\}, \left\{0., \frac{241}{512}\right\}, \left\{0.314159, \frac{1287}{2048}\right\},\right.$
$\left\{0.628319, \frac{6251}{8192}\right\}, \left\{0.942478, \frac{3565}{4096}\right\}, \left\{1.25664, \frac{7779}{8192}\right\}, \left\{1.5708, \frac{8005}{8192}\right\}\right\}$

Out[ ]=

Out[ ]=

Out[ ]=

Out[ ]=
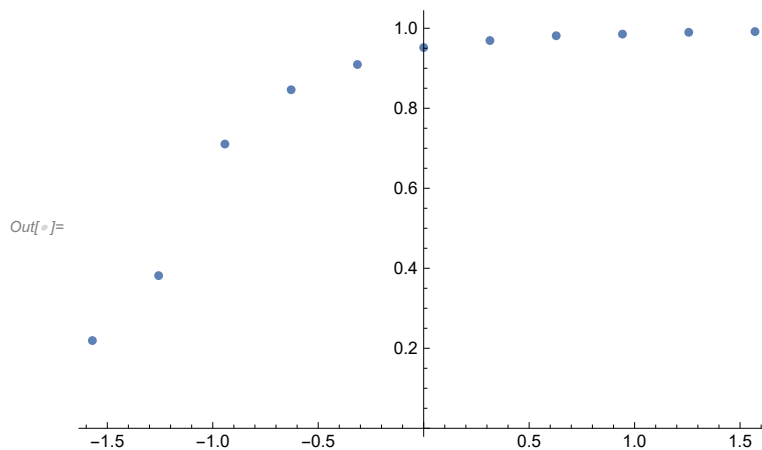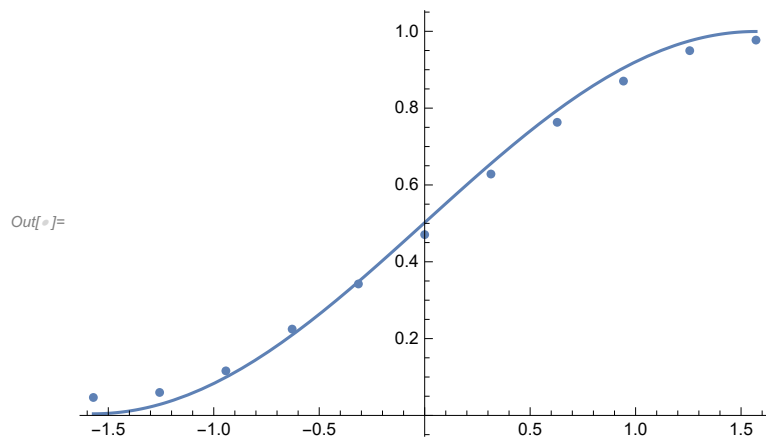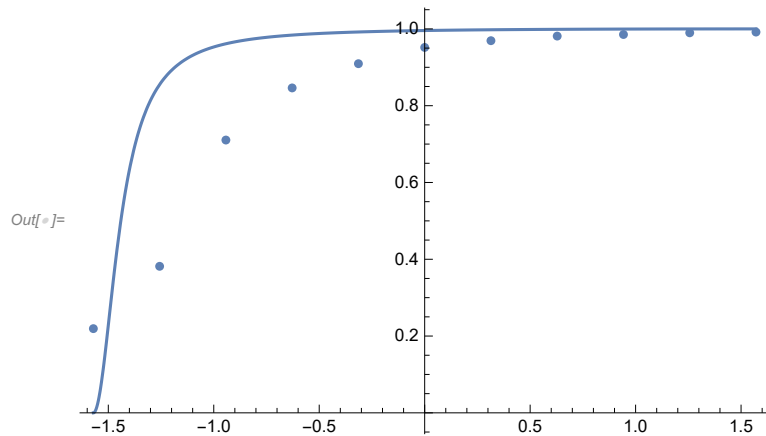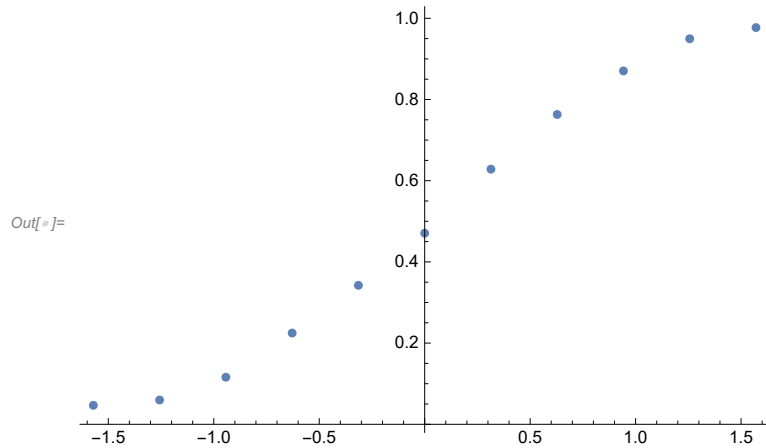
In[ ]:= **(*ibm_lagos*)**
ZeroZeroSecond10ibmlagos = 212
ZeroOneSecond10ibmlagos = 149
OneZeroSecond10ibmlagos = 176
OneOneSecond10ibmlagos = 7655

ZeroZeroSecond08ibmlagos = 331
ZeroOneSecond08ibmlagos = 123
OneZeroSecond08ibmlagos = 153
OneOneSecond08ibmlagos = 7585

```
ZeroZeroSecond06ibmlagos = 897
ZeroOneSecond06ibmlagos = 187
OneZeroSecond06ibmlagos = 148
OneOneSecond06ibmlagos = 6960

ZeroZeroSecond04ibmlagos = 1657
ZeroOneSecond04ibmlagos = 135
OneZeroSecond04ibmlagos = 147
OneOneSecond04ibmlagos = 6253

ZeroZeroSecond02ibmlagos = 2721
ZeroOneSecond02ibmlagos = 147
OneZeroSecond02ibmlagos = 141
OneOneSecond02ibmlagos = 5183

ZeroZeroFirst00ibmlagos = 3869
ZeroOneFirst00ibmlagos = 149
OneZeroFirst00ibmlagos = 120
OneOneFirst00ibmlagos = 4054

ZeroZeroFirst02ibmlagos = 5080
ZeroOneFirst02ibmlagos = 144
OneZeroFirst02ibmlagos = 119
OneOneFirst02ibmlagos = 2849

ZeroZeroFirst04ibmlagos = 6076
ZeroOneFirst04ibmlagos = 149
OneZeroFirst04ibmlagos = 106
OneOneFirst04ibmlagos = 1861

ZeroZeroFirst06ibmlagos = 6855
ZeroOneFirst06ibmlagos = 199
OneZeroFirst06ibmlagos = 89
OneOneFirst06ibmlagos = 1049

ZeroZeroFirst08ibmlagos = 7445
ZeroOneFirst08ibmlagos = 178
OneZeroFirst08ibmlagos = 95
OneOneFirst08ibmlagos = 474

ZeroZeroFirst10ibmlagos = 7554
ZeroOneFirst10ibmlagos = 353
OneZeroFirst10ibmlagos = 98
OneOneFirst10ibmlagos = 187
```

$$\text{CosSqibmlagos} =$$
$$\left\{ \left\{ -\frac{\pi}{2} * 1,\ \text{ZeroZeroSecond10ibmlagos} \big/ \left(\text{OneZeroSecond10ibmlagos} + \text{ZeroZeroSecond10ibmlagos} \right) \right\}, \right.$$
$$\left\{ -\frac{\pi}{2} * 0.8,\ \text{ZeroZeroSecond08ibmlagos} \big/ \right.$$

```
      (OneZeroSecond08ibmlagos + ZeroZeroSecond08ibmlagos)}, {- π/2 * 0.6,

      ZeroZeroSecond06ibmlagos / (OneZeroSecond06ibmlagos + ZeroZeroSecond06ibmlagos)},

     {- π/2 * 0.4, ZeroZeroSecond04ibmlagos /

        (OneZeroSecond04ibmlagos + ZeroZeroSecond04ibmlagos)}, {- π/2 * 0.2,

      ZeroZeroSecond02ibmlagos / (OneZeroSecond02ibmlagos + ZeroZeroSecond02ibmlagos)},

     { π/2 * 0.0, ZeroZeroFirst00ibmlagos / (OneZeroFirst00ibmlagos + ZeroZeroFirst00ibmlagos)},

     { π/2 * 0.2, ZeroZeroFirst02ibmlagos / (OneZeroFirst02ibmlagos + ZeroZeroFirst02ibmlagos)},

     { π/2 * 0.4, ZeroZeroFirst04ibmlagos / (OneZeroFirst04ibmlagos + ZeroZeroFirst04ibmlagos)},

     { π/2 * 0.6, ZeroZeroFirst06ibmlagos / (OneZeroFirst06ibmlagos + ZeroZeroFirst06ibmlagos)},

     { π/2 * 0.8, ZeroZeroFirst08ibmlagos / (OneZeroFirst08ibmlagos + ZeroZeroFirst08ibmlagos)},

     { π/2 * 1, ZeroZeroFirst10ibmlagos / (OneZeroFirst10ibmlagos + ZeroZeroFirst10ibmlagos)}}

Decisivenessibmlagos =
  {{- π/2 * 1, (OneZeroSecond10ibmlagos + ZeroZeroSecond10ibmlagos) / 8192},

    {- π/2 * 0.8, (OneZeroSecond08ibmlagos + ZeroZeroSecond08ibmlagos) / 8192},

    {- π/2 * 0.6, (OneZeroSecond06ibmlagos + ZeroZeroSecond06ibmlagos) / 8192},

    {- π/2 * 0.4, (OneZeroSecond04ibmlagos + ZeroZeroSecond04ibmlagos) / 8192},

    {- π/2 * 0.2, (OneZeroSecond02ibmlagos + ZeroZeroSecond02ibmlagos) / 8192},

    {- π/2 * 0.0, (OneZeroFirst00ibmlagos + ZeroZeroFirst00ibmlagos) / 8192},

    { π/2 * 0.2, (OneZeroFirst02ibmlagos + ZeroZeroFirst02ibmlagos) / 8192},

    { π/2 * 0.4, (OneZeroFirst04ibmlagos + ZeroZeroFirst04ibmlagos) / 8192},

    { π/2 * 0.6, (OneZeroFirst06ibmlagos + ZeroZeroFirst06ibmlagos) / 8192},

    { π/2 * 0.8, (OneZeroFirst08ibmlagos + ZeroZeroFirst08ibmlagos) / 8192},

    { π/2 * 1.0, (OneZeroFirst10ibmlagos + ZeroZeroFirst10ibmlagos) / 8192}}

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

Out[•]= 212

Out[•]= 149

Out[ ]= 176

Out[ ]= 7655

Out[ ]= 331

Out[ ]= 123

Out[ ]= 153

Out[ ]= 7585

Out[ ]= 897

Out[ ]= 187

Out[ ]= 148

Out[ ]= 6960

Out[ ]= 1657

Out[ ]= 135

Out[ ]= 147

Out[ ]= 6253

Out[ ]= 2721

Out[ ]= 147

Out[ ]= 141

Out[ ]= 5183

Out[ ]= 3869

Out[ ]= 149

Out[ ]= 120

Out[ ]= 4054

Out[ ]= 5080

Out[ ]= 144

Out[ ]= 119

Out[ ]= 2849

Out[ ]= 6076

Out[ ]= 149

Out[ ]= 106

Out[ ]= 1861

Out[ ]= 6855

Out[●]= 199

Out[●]= 89

Out[●]= 1049

Out[●]= 7445

Out[●]= 178

Out[●]= 95

Out[●]= 474

Out[●]= 7554

Out[●]= 353

Out[●]= 98

Out[●]= 187

Out[●]= $\left\{\left\{-\frac{\pi}{2}, \frac{53}{97}\right\}, \left\{-1.25664, \frac{331}{484}\right\}, \left\{-0.942478, \frac{897}{1045}\right\},\right.$
$\left\{-0.628319, \frac{1657}{1804}\right\}, \left\{-0.314159, \frac{907}{954}\right\}, \left\{0., \frac{3869}{3989}\right\}, \left\{0.314159, \frac{5080}{5199}\right\},$
$\left\{0.628319, \frac{3038}{3091}\right\}, \left\{0.942478, \frac{6855}{6944}\right\}, \left\{1.25664, \frac{1489}{1508}\right\}, \left\{\frac{\pi}{2}, \frac{3777}{3826}\right\}\right\}$

Out[●]= $\left\{\left\{-\frac{\pi}{2}, \frac{97}{2048}\right\}, \left\{-1.25664, \frac{121}{2048}\right\}, \left\{-0.942478, \frac{1045}{8192}\right\},\right.$
$\left\{-0.628319, \frac{451}{2048}\right\}, \left\{-0.314159, \frac{1431}{4096}\right\}, \left\{0., \frac{3989}{8192}\right\}, \left\{0.314159, \frac{5199}{8192}\right\},$
$\left\{0.628319, \frac{3091}{4096}\right\}, \left\{0.942478, \frac{217}{256}\right\}, \left\{1.25664, \frac{1885}{2048}\right\}, \left\{1.5708, \frac{1913}{2048}\right\}\right\}$

Out[●]=

Out[●]=

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