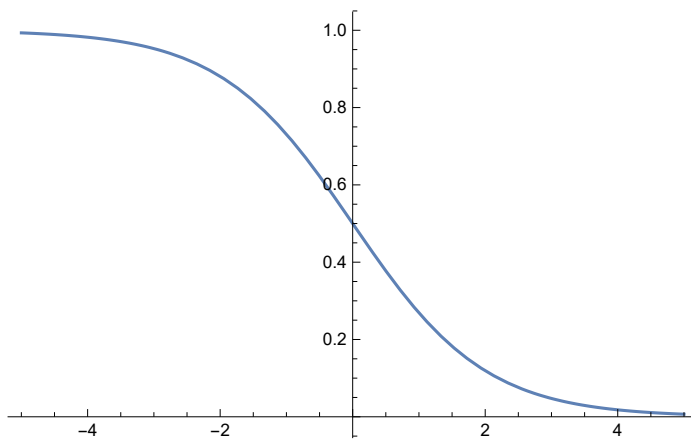


```
In[1]:= F[x_] := 1 / (1 + Exp[x]);  
Plot[F[x], {x, -5, 5}]
```

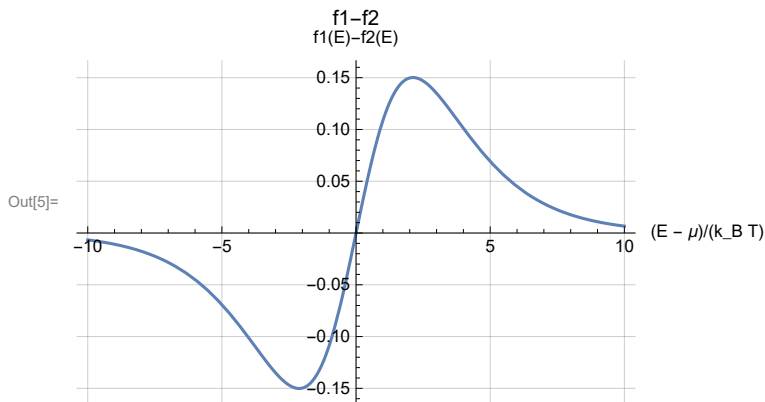
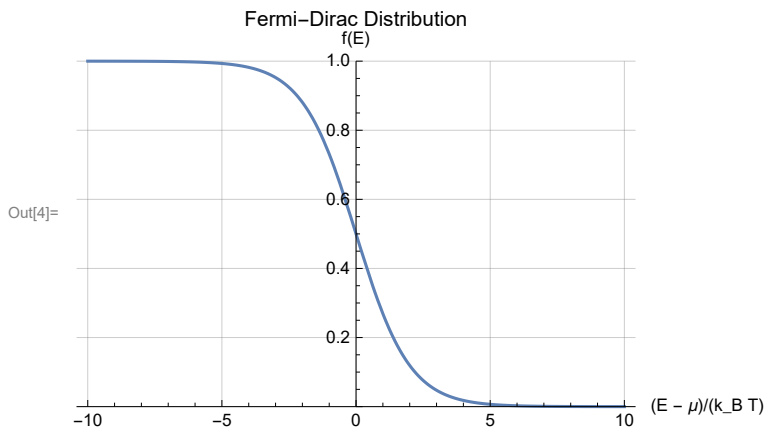
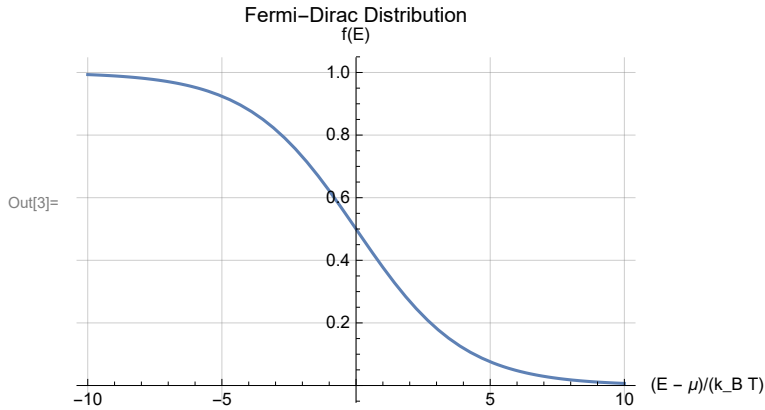
Out[2]=



```

In[3]:= Plot[1/(Exp[x/2] + 1), {x, -10, 10}, AxesLabel → {"(E - μ)/(k_B T)", "f(E)"},
  PlotLabel → "Fermi-Dirac Distribution", GridLines → Automatic]
Plot[1/(Exp[x] + 1), {x, -10, 10}, PlotRange → {0, 1},
  AxesLabel → {"(E - μ)/(k_B T)", "f(E)"},
  PlotLabel → "Fermi-Dirac Distribution", GridLines → Automatic]
Plot[(1/(Exp[x/2] + 1)) - (1/(Exp[x] + 1)), {x, -10, 10},
  AxesLabel → {"(E - μ)/(k_B T)", "f1(E)-f2(E)"},
  PlotLabel → "f1-f2", GridLines → Automatic]

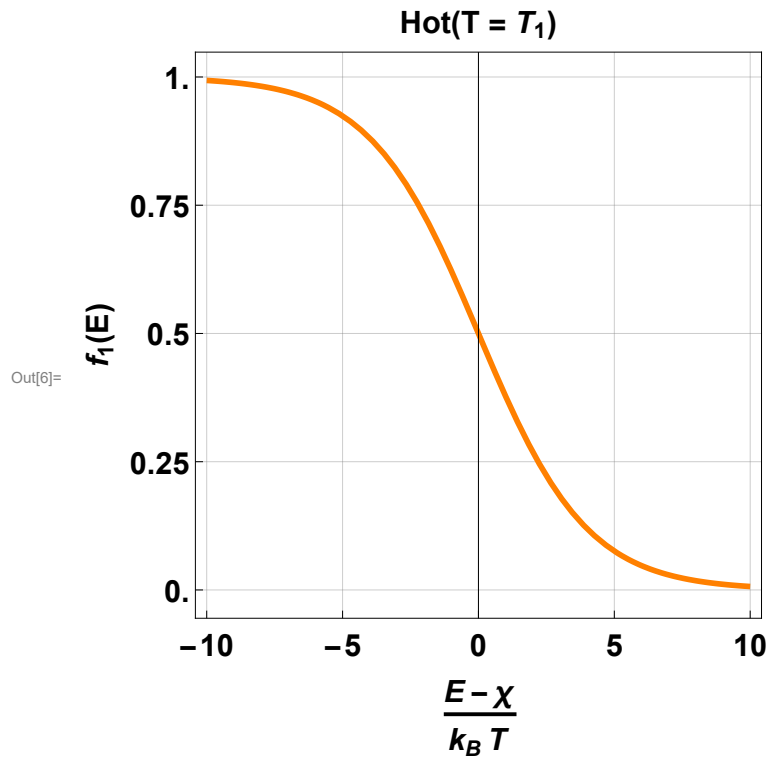
```



```

In[6]:= Plot[1 / (Exp[x / 2] + 1), {x, -10, 10},
  AspectRatio -> 1, (*AxesOrigin->{0,0.5},*) Axes -> True,
  GridLines -> {{-10, -5, 0, 5, 10}, {0.00, .25, 0.50, 0.75, 1.00}}, PlotTheme -> "Scientific",
  FrameLabel -> {{HoldForm["f1(E)"], None}, {HoldForm[" $\frac{E - \chi}{k_B T}$ "], HoldForm["Hot (T = T1)"]}},
  AxesStyle -> Black, LabelStyle -> {14, GrayLevel[0], Bold},
  FrameStyle -> Directive[Black, 16],
  FrameTicks -> {{0.00, .25, 0.50, 0.75, 1.00}, None}, {{-10, -5, 0, 5, 10}, None}},
  PlotStyle -> {Orange, Thickness[0.01]}]

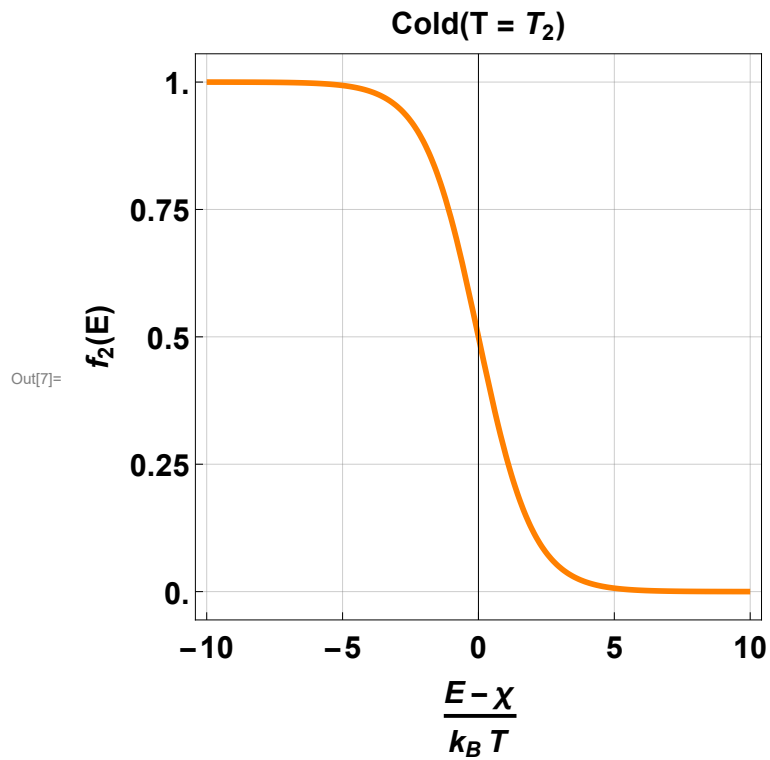
```



```

In[7]:= Plot[1 / (Exp[x] + 1), {x, -10, 10}, AspectRatio → 1, (*AxesOrigin→{0,0.5},*) Axes → True,
  GridLines → {{-10, -5, 0, 5, 10}, {0.00, .25, 0.50, 0.75, 1.00}}, PlotTheme → "Scientific",
  FrameLabel → {{HoldForm["f2(E)"], None}, {HoldForm[" $\frac{E - \chi}{k_B T}$ "], HoldForm["Cold (T = T2)"]}},
  AxesStyle → Black, LabelStyle → {14, GrayLevel[0], Bold},
  FrameStyle → Directive[Black, 16],
  FrameTicks → {{0.00, .25, 0.50, 0.75, 1.00}, None}, {{-10, -5, 0, 5, 10}, None}},
  PlotStyle → {Orange, Thickness[0.01]}]

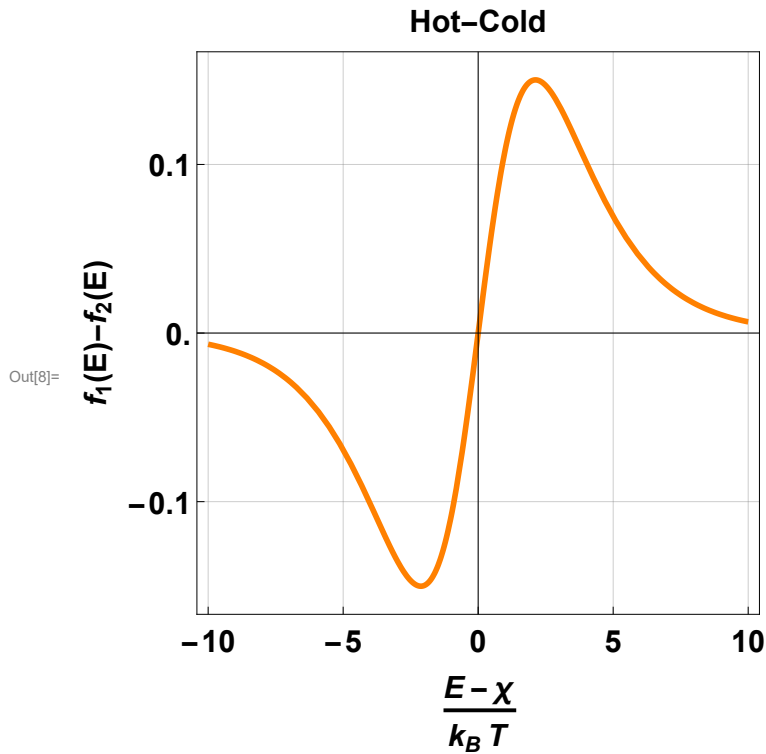
```



```

In[8]:= Plot[(1/(Exp[x/2] + 1)) - (1/(Exp[x] + 1)), {x, -10, 10}, AspectRatio → 1, Axes → True,
  GridLines → {{-10, -5, 0, 5, 10}, {-0.1, 0.0, 0.1}}, PlotTheme → "Scientific", FrameLabel →
    {{HoldForm["f1(E) - f2(E)"], None}, {HoldForm[" $\frac{E - \chi}{k_B T}$ "], HoldForm["Hot-Cold"]}},
  AxesStyle → Black, LabelStyle → {14, GrayLevel[0], Bold},
  FrameStyle → Directive[Black, 16],
  FrameTicks → {{{-0.1, 0.0, 0.1}, None}, {{-10, -5, 0, 5, 10}, None}},
  PlotStyle → {Orange, Thickness[0.01]}]

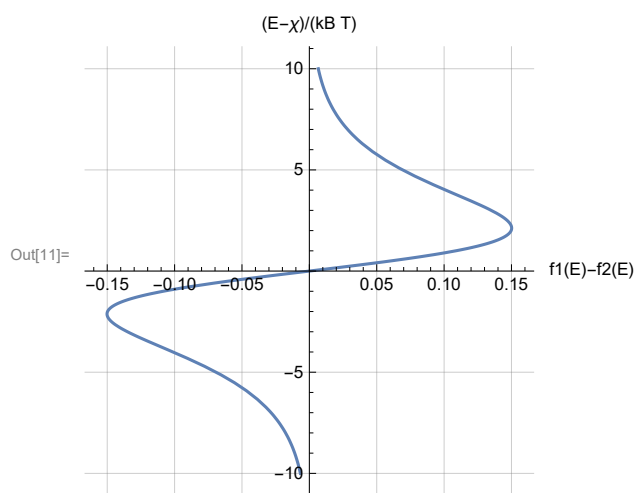
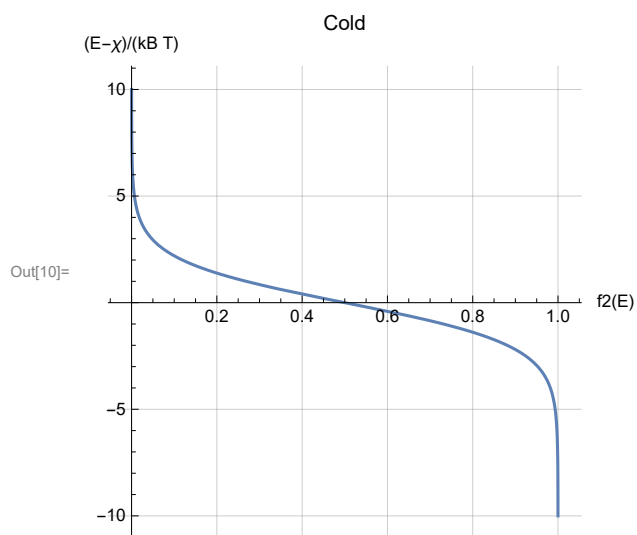
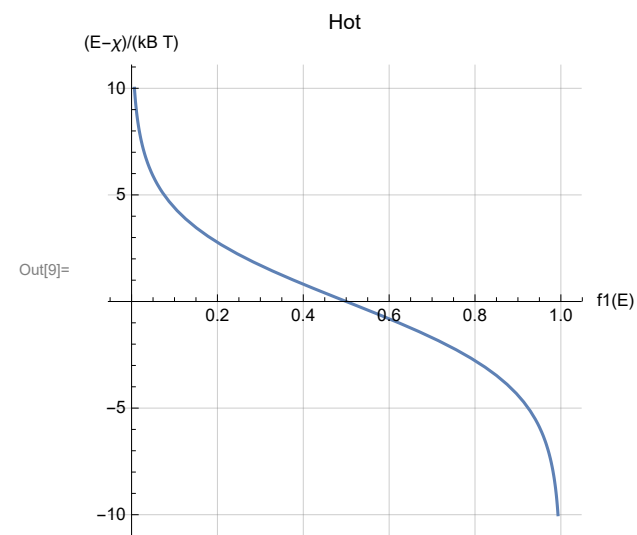
```



```

In[9]:= ParametricPlot[{1/(1 + Exp[x/2]), x}, {x, -10, 10}, AspectRatio → 1,
  AxesLabel → {"f1(E)", "(E - χ) / (kB T)"}, PlotLabel → "Hot", GridLines → Automatic]
ParametricPlot[{1/(1 + Exp[x]), x}, {x, -10, 10}, AspectRatio → 1,
  AxesLabel → {"f2(E)", "(E - χ) / (kB T)"}, PlotLabel → "Cold", GridLines → Automatic]
ParametricPlot[{(1/(1 + Exp[x/2])) - (1/(1 + Exp[x])), x}, {x, -10, 10},
  AspectRatio → 1, AxesLabel → {"f1(E) - f2(E)", "(E - χ) / (kB T)"}, GridLines → Automatic]

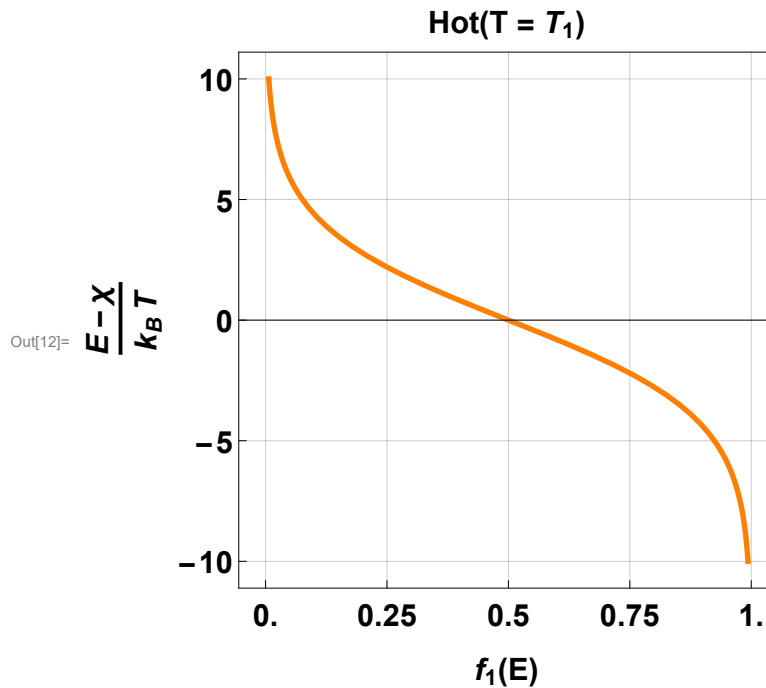
```



```

In[12]:= ParametricPlot[{1 / (1 + Exp[x / 2]), x}, {x, -10, 10},
  AspectRatio -> 1, (*AxesOrigin->{0.5,0},*) Axes -> True,
  GridLines -> {{0.00, .25, 0.50, 0.75, 1.00}, {-10, -5, 0, 5, 10}}, PlotTheme -> "Scientific",
  FrameLabel -> {{HoldForm[" $\frac{E - \chi}{k_B T}$ "], None}, {HoldForm[" $f_1(E)$ "], HoldForm["Hot (T = T1)"]}},
  AxesStyle -> Black, LabelStyle -> {14, GrayLevel[0], Bold},
  FrameStyle -> Directive[Black, 16],
  FrameTicks -> {{{-10, -5, 0, 5, 10}, None}, {{0.00, .25, 0.50, 0.75, 1.00}, None}},
  PlotStyle -> {Orange, Thickness[0.01]}]

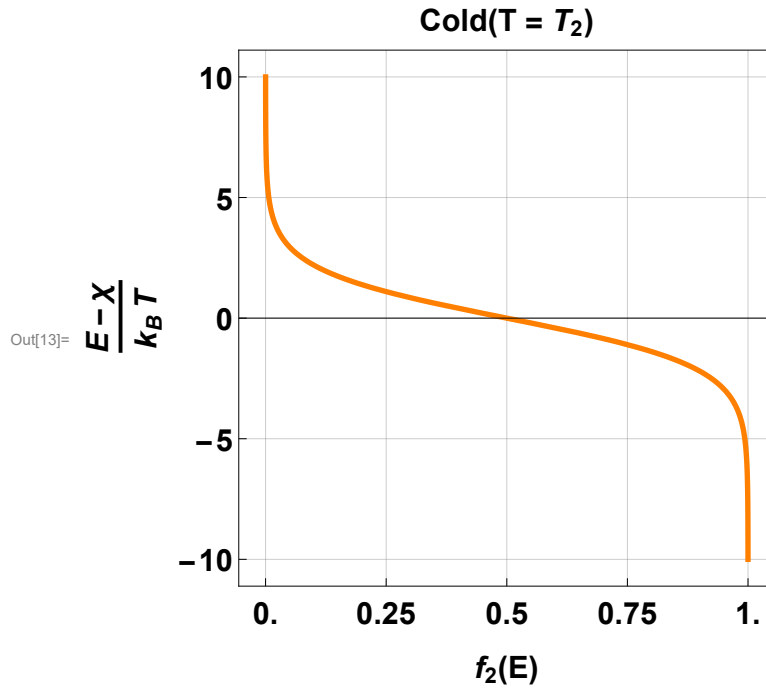
```



```

In[13]:= ParametricPlot[{1/(1 + Exp[x]), x}, {x, -10, 10},
  AspectRatio -> 1, (*AxesOrigin->{0.5,0},*) Axes -> True,
  GridLines -> {{0.00, .25, 0.50, 0.75, 1.00}, {-10, -5, 0, 5, 10}}, PlotTheme -> "Scientific",
  FrameLabel -> {{HoldForm[" $\frac{E - \chi}{k_B T}$ "], None}, {HoldForm[" $f_2(E)$ "], HoldForm["Cold(T = T2)"]}},
  AxesStyle -> Black, LabelStyle -> {14, GrayLevel[0], Bold},
  FrameStyle -> Directive[Black, 16],
  FrameTicks -> {{{-10, -5, 0, 5, 10}, None}, {{0.00, .25, 0.50, 0.75, 1.00}, None}},
  PlotStyle -> {Orange, Thickness[0.01]}]

```

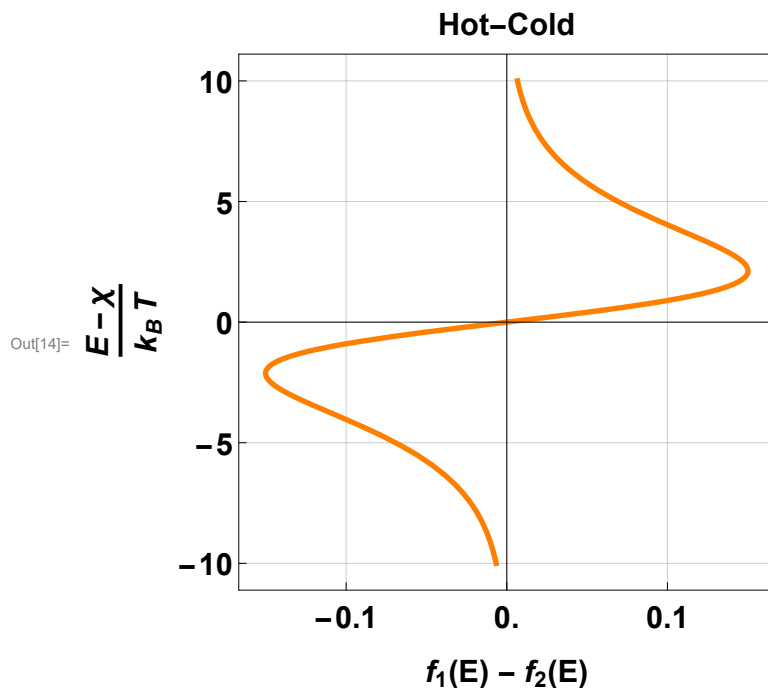




```

In[14]:= ParametricPlot[{(1/(1+Exp[x/2])) - (1/(1+Exp[x])), x},
  {x, -10, 10}, AspectRatio -> 1, Axes -> True,
  GridLines -> {{-0.1, 0.0, 0.1}, {-10, -5, 0, 5, 10}}, PlotTheme -> "Scientific", FrameLabel ->
  {{HoldForm[" $\frac{E-X}{k_B T}$ "], None}, {HoldForm[" $f_1(E) - f_2(E)$ "], HoldForm["Hot-Cold"]}},
  AxesStyle -> Black, LabelStyle -> {14, GrayLevel[0], Bold},
  FrameStyle -> Directive[Black, 16],
  FrameTicks -> {{{-10, -5, 0, 5, 10}, None}, {{-0.1, 0.0, 0.1}, None}},
  PlotStyle -> {Orange, Thickness[0.01]}]

```



```

In[15]:=

```