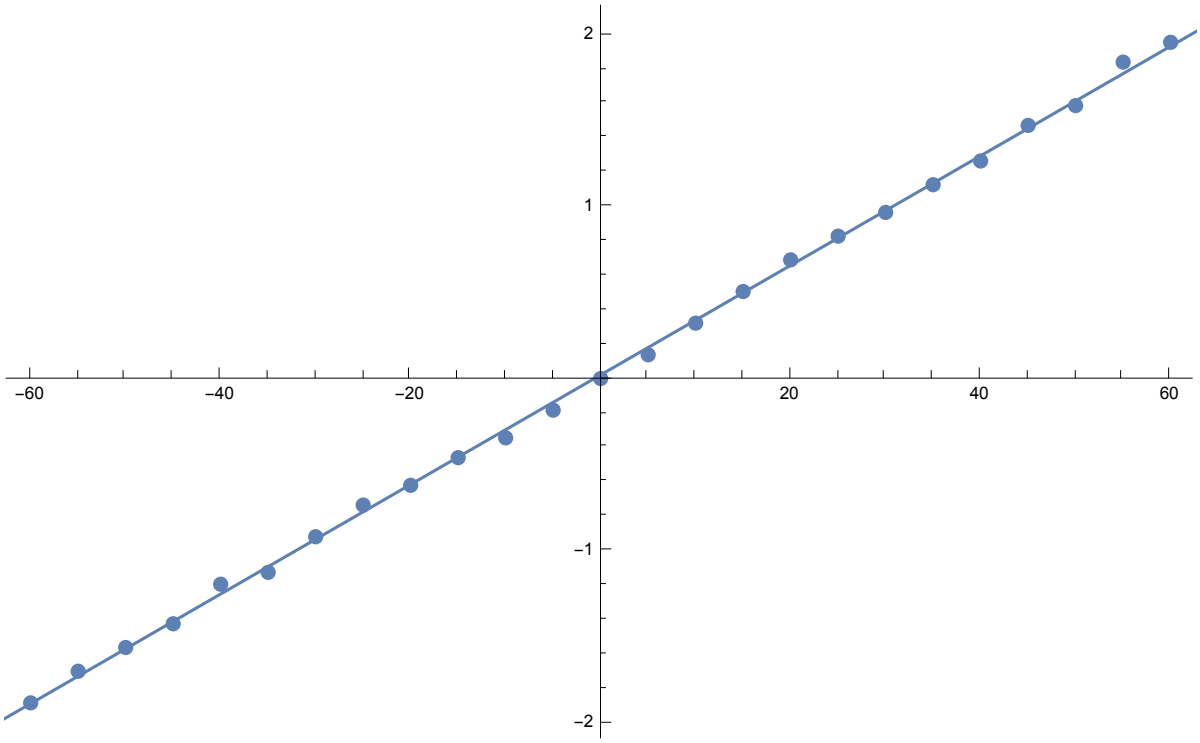
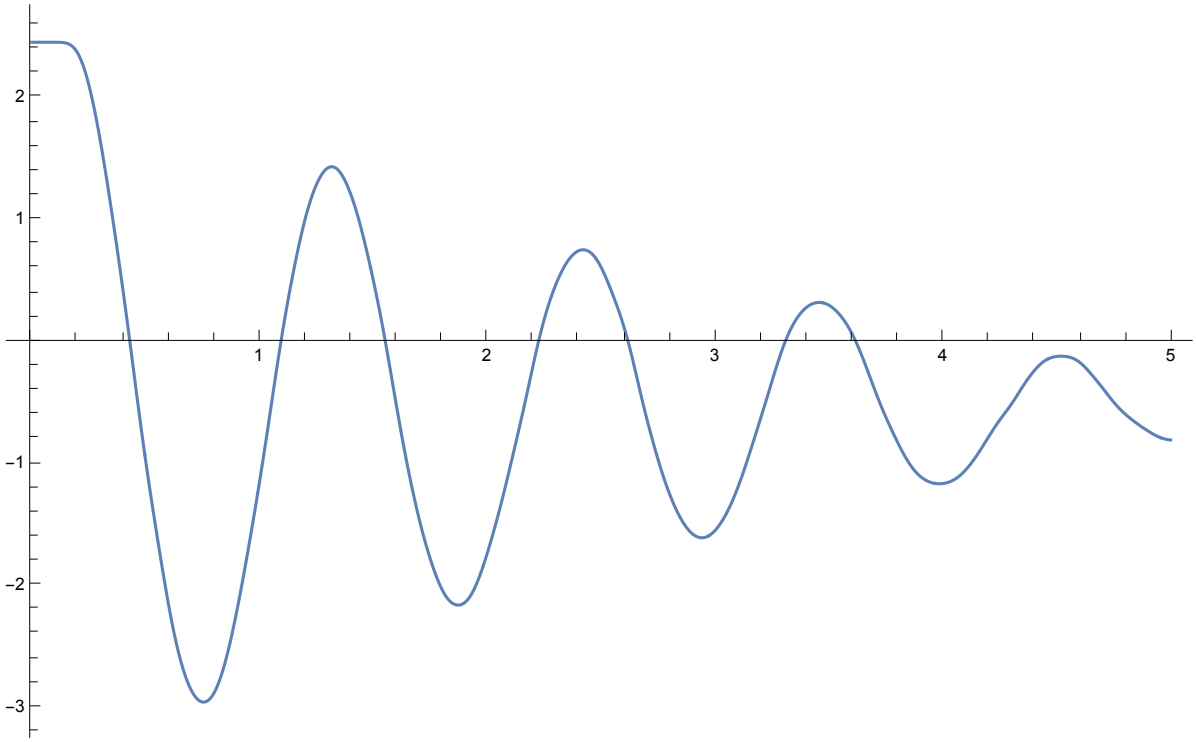
```
data = {
    {30, 1.38, 1.37}, {35, 1.46, 1.44}, {40, 1.52, 1.54},
    {45, 1.58, 1.6}, {50, 1.68, 1.68}, {55, 1.71, 1.74}, {60, 1.8, 1.79},
    {65, 1.88, 1.87}, {70, 1.93, 1.93}, {75, 2, 1.99}, {80, 2.05, 2.06},
    {85, 2.12, 2.14}, {90, 2.2, 2.2}, {95, 2.26, 2.27}, {100, 2.34, 2.33},
    {105, 2.42, 2.42}, {110, 2.5, 2.51}, {115, 2.56, 2.56},
    {120, 2.62, 2.61}, {125, 2.69, 2.7}, {130, 2.75, 2.75},
    {135, 2.84, 2.84}, {140, 2.89, 2.89}, {145, 3, 2.97}, {150, 3.05, 3.02}
   };
data[[All, 1]] = data[[All, 1]] - 90;
data[[All, 2]] = data[[All, 2]] - 2.2;

magicNumber = 2.3;
data[[All, 2]] = data[[All, 2]] * magicNumber;

separated = data[[All, {1, 2}]];
Append[separated, data[[All, {1, 3}]]];

angleModel = LinearModelFit[separated, x, x];
inverseModel = InverseFunction[angleModel[#θ] &];

Show[
 ListPlot[separated],
 Plot[angleModel[θ], {θ, -80, 80}]
]

data = Import[NotebookDirectory[] <> "Data/Experimento5.lvm", "TSV"];
data[[All, 2]] = LowpassFilter[data[[All, 2]], 0.1];

ListLinePlot[data, ImageSize → Full]
data[[All, 2]] = Map[inverseModel, data[[All, 2]]];
(* center on zero *)
data[[All, 2]] = data[[All, 2]] - Mean[data[[All, 2]]];

model = NonlinearModelFit[data, 2 π Sqrt[l/g (1 + 1/4 Sin[θ/2]^2)], {l, g}, {θ}];

ListLinePlot[data, ImageSize → Full]
```





NonlinearModelFit::nrlnum: The function value

$$\{-90.7281+6.28319\sqrt{1.[1.]}\,,\ -90.7281+6.28319\sqrt{1.[1.]}\,,\ -90.7281+6.28319\sqrt{1.[1.00001]}\,,\ -90.7281+6.28319\sqrt{1.[1.00001]}\,,\ \ll 43 \gg,\ -82.8538+6.28319\sqrt{1.[1.00344]}\,,\ -81.8506+6.28319\sqrt{1.[1.00358]}\,,\ -80.7835+6.28319\sqrt{1.[1.00373]}\,,\ \ll 950 \gg\}$$

is not a list of real numbers with dimensions {1000} at {l, g} = {1., 1.}. >>

NonlinearModelFit::nrlnum: The function value

$$\{-90.7281+6.28319\sqrt{1.[1.]},\ -90.7281+6.28319\sqrt{1.[1.]},\ -90.7281+6.28319\sqrt{1.[1.00001]},\ -90.7281+6.28319\sqrt{1.[1.00001]},\ \ll 43\gg,\ -82.8538+6.28319\sqrt{1.[1.00344]},\ -81.8506+6.28319\sqrt{1.[1.00358]},\ -80.7835+6.28319\sqrt{1.[1.00373]},\ \ll 950\gg\}$$

is not a list of real numbers with dimensions {1000} at {l, g} = {1., 1.}. ≫