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# METODA BISEKCE

```
In[5]:= F[x_] = Sin[x];
```

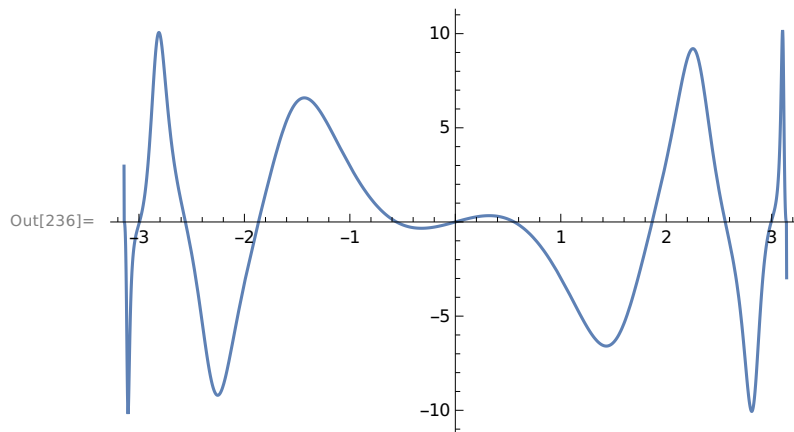
```
Bisekce[a0_, b0_, m_] := Module[{a = N[a0], b = N[b0]},  
  c = (a + b) / 2;  
  k = 0;  
  While[k < m,  
    If[Sign[F[b]] == Sign[F[c]], b = c, a = c];  
    c = (a + b) / 2;  
    k = k + 1;  
  ];  
  (*  
  Print[" c = ", NumberForm[c,16]];  
  Print[" Δc = ±", (b-a)/2];  
  Print[" F[c] = ", NumberForm[F[c], 16]];  
  *)  
  Return[c];  
];
```

```
Bisekce[1, 4, 100]
```

```
Out[7]= 3.14159
```

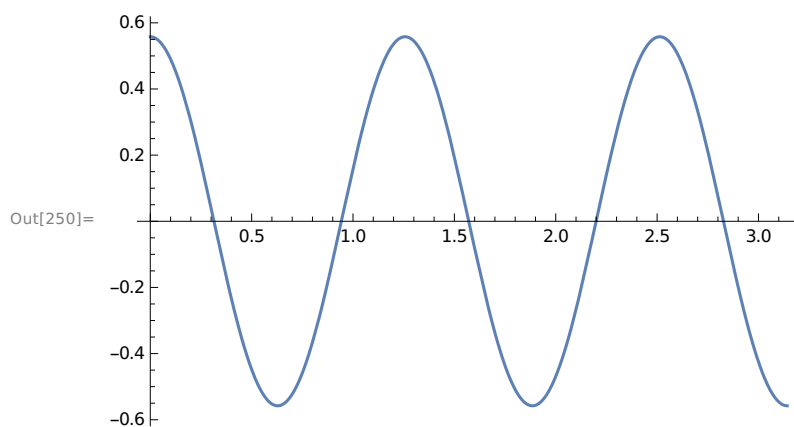
# METODA STŘELBY

```
In[235]:= F[α_] := Module[{},
  res = NDSolve[{y1'[x] == y2[x], y2'[x] + 26 Sin[y1[x]] == 0, y1[0] == α, y2[0] == 0},
    {y1[x], y2[x]}, {x, 0, π}];
  vysl = ((y2[x] /. res) /. x → π)[[1]];
  Return[vysl];
];
Plot[F[α], {α, -π, π}]
```



```
In[248]:= y0 = Bisekce[0.2, 1.0, 100]
res = NDSolve[{y1'[x] == y2[x], y2'[x] + 26 Sin[y1[x]] == 0, y1[0] == y0, y2[0] == 0},
  {y1[x], y2[x]}, {x, 0, π}];
Plot[Evaluate[y1[x] /. res], {x, 0, π}, PlotRange → All]
```

Out[248]= 0.557852



# DIAGRAM ŘEŠENÍ

```

In[203]:= Clear[FF]
FF[α_, λ_] := Module[{},
  res = NDSolve[{y1'[x] == y2[x], y2'[x] + λ Sin[y1[x]] == 0, y1[0] == α, y2[0] == 0},
    {y1[x], y2[x]}, {x, 0, π}];
  vysl = ((y2[x] /. res) /. x → π)[[1]];
  Return[vysl];
];

data = {};
For[λ = 0, λ < 28, λ += 0.1,
  F[α_] := FF[α, λ];
  krok = 0.1;
  For[a = -π, a ≤ π, a += krok,
    If[F[a] F[a + krok] < 0,
      vysl = Bisekce[a, a + krok, 10];
      AppendTo[data, {λ, vysl}]
    ]
  ]
]

```

```

In[207]:= ListPlot[data, PlotStyle → {PointSize[0.004]},
  PlotRange → {{0, 28}, {-π, π}}, GridLines → {{0, 1, 4, 9, 16, 25}, {}},
  AspectRatio → Automatic, PlotLabel → "diagram řešení", AxesLabel → {"λ", "α"}]

```

