# Personalizzazione di una rotuine proposta da Stan Wagon

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```
In[1]:= Plot[
        0, {x, -4, 4},
        PlotStyle → {RGBColor[1, 1, 1]},
        AxesLabel → {"x", "y"},
        Ticks → {
          {{-2, "-x₁"}, {2, "x₁"}},
          None
         },
        Epilog → {
          {Dashed, Line[{{-2.3, -1}, {-2.3, 1}}]},
          {Dashed, Line[{{-2.0, -1}, {-2.0, 1}}]},
          {Dashed, Line[{{2.0, -1}, {2.0, 1}}]},
          {Dashed, Line[{{1.2, -1}, {1.2, 1}}]},
          Arrow[{{-2.3, 0}, {-2.9, -0.3}}],
          Arrow[{{1.2, 0}, {0.8, -0.3}}],
          Point[{-2.3, 0}],
          Point[{-2.0, 0}],
          Point[{2, 0}],
          Point[{1.2, 0}],
          Text["-(x₁+ δr/n )", {-3, -0.4}],
          Text["t", {0.8, -0.35}],
          {RGBColor[1, 0, 0], Thickness[0.004], Line[{{-2, 0}, {2, 0}}]}
         }
       ]
```

Out[1]=
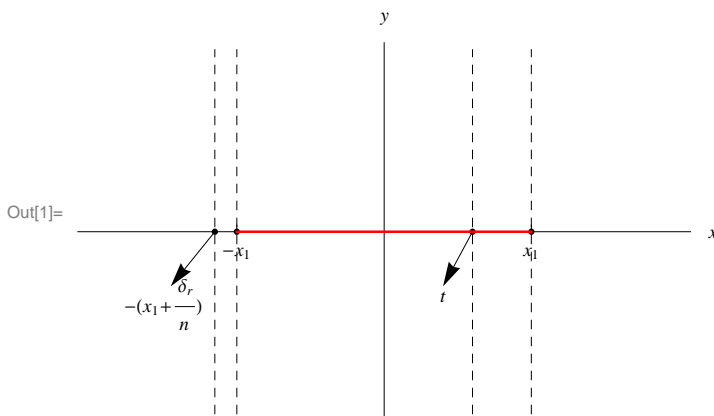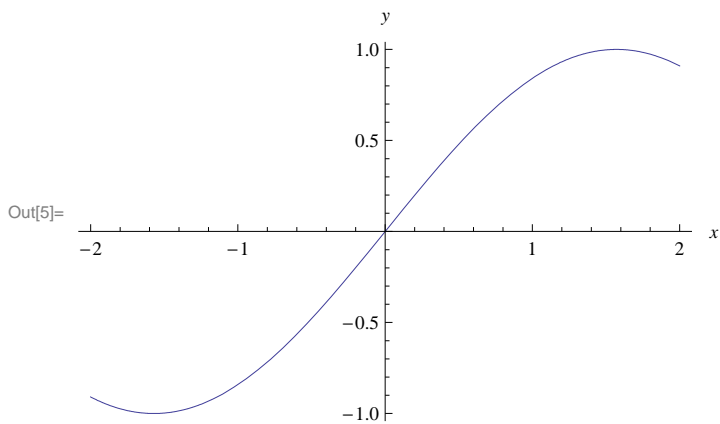


```
In[2]:= f[x_] := Sin[x]
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In[3]:= Df[x_] = f'[x];
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In[4]:= plotf[x1_] := Plot[
        f[x], {x, -x1, x1},
        AxesLabel → {"x", "y"}
       ]
```
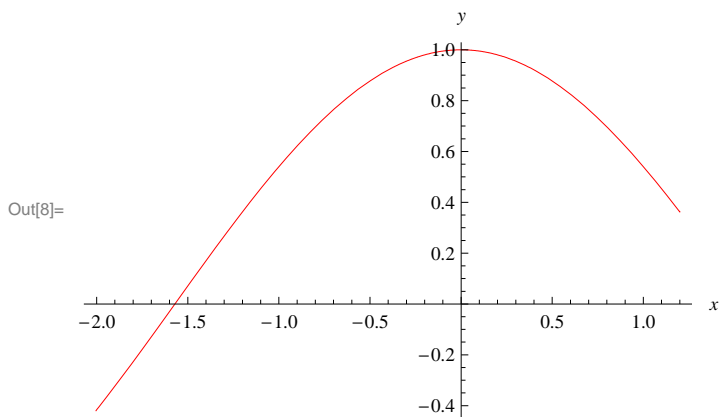
In[5]:= **plotf2 = plotf[2]**

Out[5]=

In[6]:= $\boldsymbol{\delta[r\_, x1\_] := \dfrac{2 * x1}{r}}$

In[7]:= $\boldsymbol{plotder[t\_, r\_, x1\_, n\_] := Plot\Big[}$

$\boldsymbol{f'[x], \Big\{x, -\Big(x1 + \dfrac{\delta[r, x1]}{n}\Big), t\Big\},}$

$\boldsymbol{AxesLabel \to \{"x", "y"\},}$

$\boldsymbol{PlotStyle \to RGBColor[1, 0, 0]}$

$\boldsymbol{\Big]}$

In[8]:= **plotder[1.2, 10, 2, 100]**

Out[8]=

In[9]:= $\boldsymbol{show[t\_, r\_, x1\_, n\_] := Show\Big[}$

$\boldsymbol{plotder[t, r, x1, n],}$

$\boldsymbol{plotf[x1],}$

$\boldsymbol{PlotRange \to \Big\{\Big\{-\Big(x1 + \dfrac{\delta[r, x1]}{n}\Big), x1\Big\}, \{-1, 1\}\Big\},}$

$\boldsymbol{Ticks \to \Big\{}$

$\boldsymbol{\Big\{\{x1, "x_1"\}, \Big\{-\Big(x1 + \dfrac{\delta[r, x1]}{n}\Big), "-(x_1 + \dfrac{\delta_r}{n})"\Big\}, \{t, "t"\}\Big\},}$

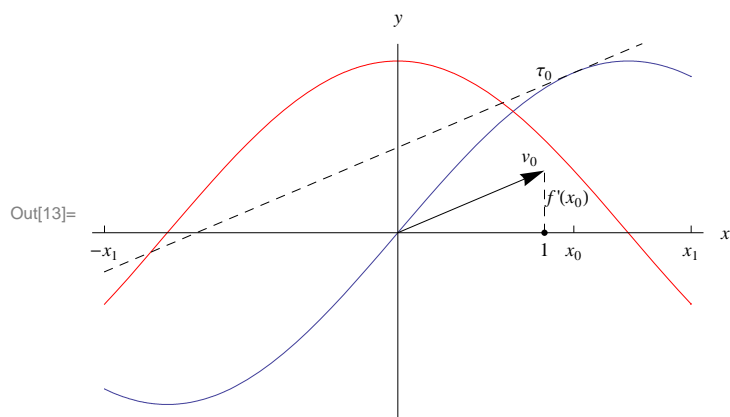$\boldsymbol{\{-1, 1\}\Big\}}$

$\boldsymbol{\Big]}$

In[10]:= **show[1.2, 10, 2, 100]**

Out[10]=
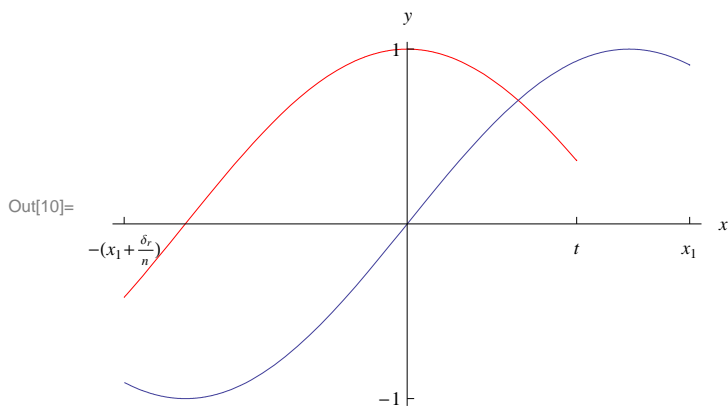
In[11]:= **tangente[x_, x0_] := Df[x0] * (x - x0) + f[x0]**

In[12]:= **plotvector[x0_] := Plot[**
    {f[x], Df[x], tangente[x, x0]}, {x, -2, 2},
    AxesLabel → {"x", "y"},
    PlotRange → {-1.1, 1.1},
    PlotStyle → {
      Thickness[0.001],
      {RGBColor[1, 0, 0]},
      {Dashed, RGBColor[0, 0, 0], Thickness[0.001]}
     },
    Ticks → {
      {
       1,
       {-2, "-x₁"},
       {2, "x₁"},
       {x0, "x₀"}
      },
      None
     },
    Epilog → {
      Arrow[{{0, 0}, {1, Df[x0]}}],
      Text["v₀", {0.9, 0.45}],
      Text["τ₀", {1.0, 0.95}],
      {Dashed, Line[{{1, 0}, {1, Df[x0]}}]},
      Point[{1, 0}],
      Text["f'(x₀)", {1.15, 0.2}]
     }
    ]

In[13]:= **plotvector[1.2]**

Out[13]=

In[14]:= **plotvector1[x0_] := Plot[**
    {f[x], Df[x], tangente[x, x0]}, {x, -2, 2},
    AxesLabel → {"\!\(*
StyleBox[\"x\",\nFontSlant->\"Italic\"]\)", "\!\(*
StyleBox[\"y\",\nFontSlant->\"Italic\"]\)"},
    PlotRange → {-1.1, 1.1},
    PlotStyle → {
      Thickness[0.001],
      {RGBColor[1, 0, 0]},
      {Dashed, RGBColor[0, 0, 0], Thickness[0.001]}
     },
    Ticks → {
      {
       1,
       {-2, "-x₁"},
       {2, "x₁"},
       {x0, "x₀"}
      },
      None
     },
    ImageSize → {500, 500},
    Epilog → {
     Arrow[{{0, 0}, {1, Df[x0]}}]
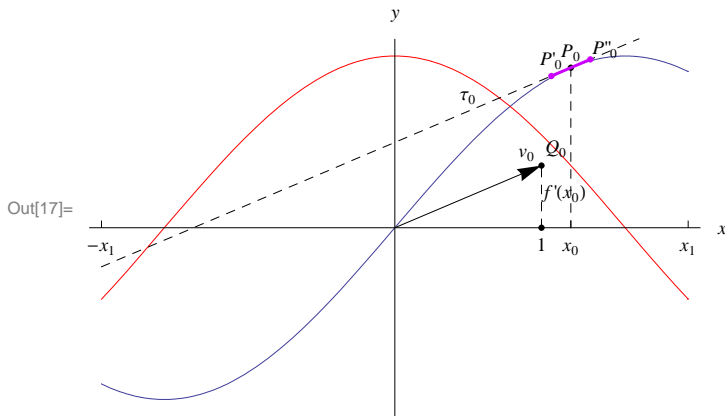   **}**
 ]

In[15]:= **rotazione = Table[**
    plotvector1[x0], {x0, -2, 2, 0.1}
    ];

```
In[16]:= plotvector2[x0_] := Plot[
          {f[x], Df[x], tangente[x, x0]}, {x, -2, 2},
         AxesLabel → {"x", "y"},
         PlotRange → {-1.1, 1.1},
         PlotStyle → {
           Thickness[0.001],
           {RGBColor[1, 0, 0]},
           {Dashed, RGBColor[0, 0, 0], Thickness[0.001]}
          },
         Ticks → {
           {
            1,
            {-2, "-x₁"},
            {2, "x₁"},
            {x0, "x₀"}
           },
           None
          },
         Epilog → {
           Arrow[{{0, 0}, {1, Df[x0]}}],
           Text["v₀", {0.9, 0.45}],
           Text["τ₀", {0.5, 0.78}],
           {Dashed, Line[{{1, 0}, {1, Df[x0]}}]},
           Point[{1, 0}],
           Text["f'(x₀)", {1.15, 0.2}],
           Point[{x0, f[x0]}],
           Text["P₀", {x0, f[x0] + 0.1}],
           Point[{1, f'[x0]}],
           Text["Q₀", {1.1, f'[x0] + 0.1}],
           {Hue[0.8], Point[{{x0 - δ[10, 2]/3, f[x0] - δ[10, 2]/3 f'[x0]}}]},
           {Hue[0.8], Point[{{x0 + δ[10, 2]/3, f[x0] + δ[10, 2]/3 f'[x0]}}]},
           Text["P'₀", {x0 - δ[10, 2]/3, f[x0] - δ[10, 2]/3 f'[x0] + 0.1}],
           Text["P''₀", {x0 + δ[10, 2]/3 + 0.1, f[x0] + δ[10, 2]/3 f'[x0] + 0.07}],
           {Dashed, Line[{{x0, f[x0]}, {x0, 0}}]},
           {Thickness[0.005], Hue[0.8], Line[
              {{x0 - δ[10, 2]/3, f[x0] - δ[10, 2]/3 f'[x0]}, {x0 + δ[10, 2]/3, f[x0] + δ[10, 2]/3 f'[x0]}}]}
          }
         ]
```

In[17]:= **plotvector2[1.2]**

Out[17]=

In[18]:= **Clear[show]**

In[19]:= **show[t_, r_, x1_, n_] := Show[**
  {
    plotder[t, r, x1, n],
    plotf[x1],
    Graphics[
      {RGBColor[1, 0, 0], Thickness[0.005],

$$\text{Line}\left[\left\{\left\{t - \frac{\delta[10, 2]}{3}, f[t] - \frac{\delta[10, 2]}{3} f'[t]\right\}, \left\{t + \frac{\delta[10, 2]}{3}, f[t] + \frac{\delta[10, 2]}{3} f'[t]\right\}\right\}\right]\right\},$$

$$\left\{\text{Hue}[0.8], \text{Point}\left[\left\{t - \frac{\delta[10, 2]}{3}, f[t] - \frac{\delta[10, 2]}{3} f'[t]\right\}\right]\right\},$$

$$\left\{\text{Hue}[0.8], \text{Point}\left[\left\{t + \frac{\delta[10, 2]}{3}, f[t] + \frac{\delta[10, 2]}{3} f'[t]\right\}\right]\right\}$$

    ]
  },

$$\text{PlotRange} \to \left\{\left\{-\left(x1 + \frac{\delta[r, x1]}{n}\right), x1\right\}, \{-1, 1\}\right\},$$

  Ticks → $\Big\{$

$$\left\{\{x1, "x_1"\}, \left\{-\left(x1 + \frac{\delta[r, x1]}{n}\right), "-(x_1 + \frac{\delta_r}{n})"\right\}\right\},$$

    {-1, 1}},
  ImageSize → {500, 500}
  ]

In[20]:= **show[2.1, 10, 2, 100]**

Out[20]=
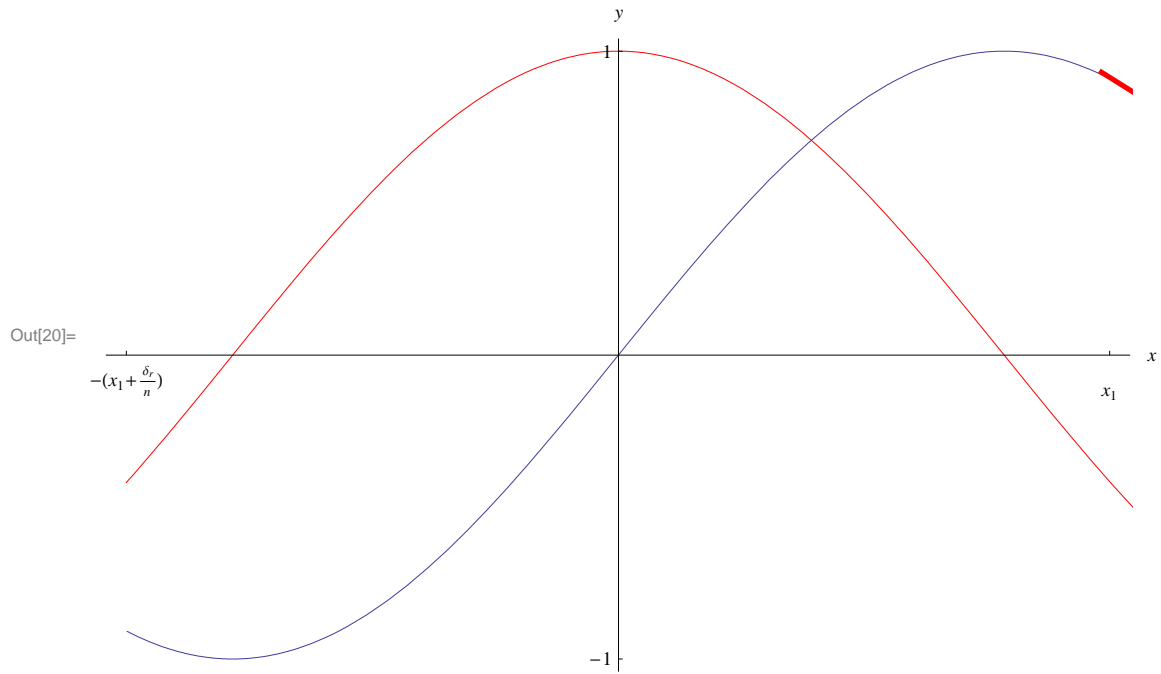
In[21]:= **graficoder = Table[**

    show[t, 10, 2, 100],

    $\left\{t, -2, 2, \dfrac{\delta[10, 2]}{2}\right\}$

]

Out[21]= {

,

,