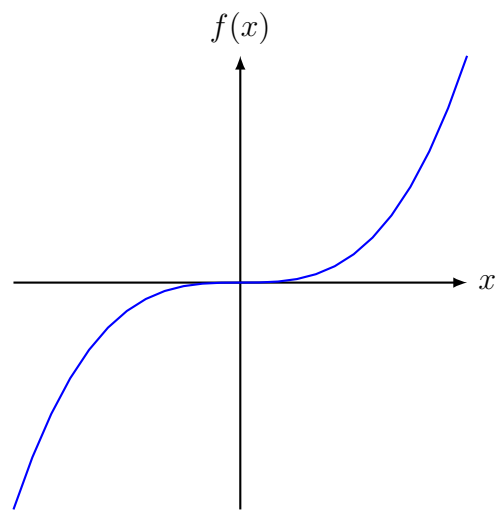


List of Figures

1	plot-02.tex: Simple function without Pgfplots	2
2	plot-01.tex: Simple function with annotations	3
3	plot-03.tex: Function with zoom without Pgfplots	4
4	plot-04.tex: Function with tangents without Pgfplots	5
5	plot-05.tex: Absolute value without Pgfplots	5
6	plot-06.tex: Annotated functions	6
7	plot-07.tex: Function with area	7
8	plot-08.tex: Circle	8
9	plot-09.tex: Iterations	9
10	plot-10.tex: Zoom on function	10
11	plot-11.tex: Multiple plots	11
12	plot-12.tex: Line and data	12
13	plot-13.tex: Function definition	13
14	plot-14.tex: Function parameterized definition	14
15	plot-15.tex: Function with area under the curve	15
16	plot-16.tex: Histogram with symbolic x -coordinates	16
17	plot-17.tex: Mixture of normal distributions	17
18	plot-18.tex: Normal distribution with area under the curve	18
19	plot-19.tex: Histogram	19
20	plot-20.tex: Annotated data, using scope	20
21	plot-21.tex: Double y axis and legend	21
22	plot-22.tex: Parametrized plot	22

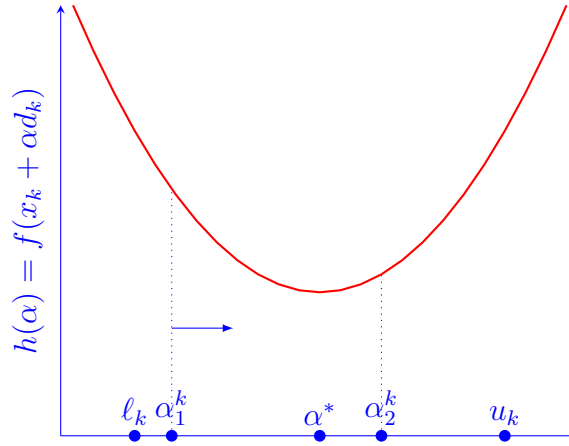


```

\begin{tikzpicture}[thick, scale=3]
  \draw[-latex] (-1, 0) -- (1, 0) node[right] {$x$};
  \draw[-latex] (0, -1) -- (0, 1) node[above] {$f(x)$};
  \draw[domain=-1:1, variable=\x, blue] plot ({\x}, {\x*\x*\x});
\end{tikzpicture}

```

Figure 1: plot-02.tex: Simple function without Pgfplots

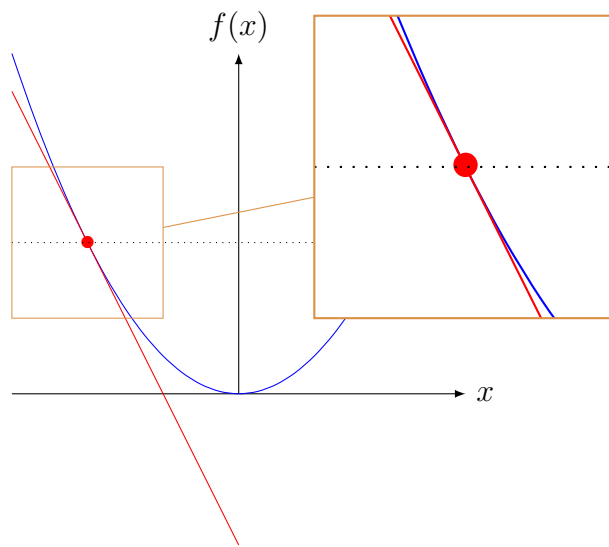


```

\begin{tikzpicture}[blue]
  \begin{axis}[
    domain=-2:2,
    axis lines=left,
    xtick=\empty,
    ytick=\empty,
    xmin=-2.1,
    xmax=2.1,
    ylabel={$h(\alpha) = f(x_k + \alpha d_k)$},
  ]
    \addplot[thick, red, mark=none] {x*x+1};
    \addplot[mark=*] coordinates { (-1.5, -1) };
    \node[anchor = south] at (axis cs: -1.5, -1) {$\ell_k$};
    \addplot[mark=*] coordinates { (1.5, -1) };
    \node[anchor = south] at (axis cs: 1.5, -1) {$u_k$};
    \addplot[mark=*] coordinates { (-1.2, -1) };
    \addplot[mark=none, dotted] coordinates { (-1.2, -1) (-1.2, 1+1.2*1.2) };
    \node[anchor = south] at (axis cs: -1.2, -1) {$\alpha_1^k$};
    \addplot[mark=*] coordinates { (0, -1) };
    \node[anchor = south] at (axis cs: 0, -1) {$\alpha^*$};
    \addplot[mark=*] coordinates { (0.5, -1) };
    \addplot[mark=none, dotted] coordinates { (0.5, -1) (0.5, 1+0.5*0.5) };
    \node[anchor = south] at (axis cs: 0.5, -1) {$\alpha_2^k$};
    \draw[-latex] (axis cs:-1.2, 0.5)--(-0.7, 0.5);
  \end{axis}
\end{tikzpicture}

```

Figure 2: plot-01.tex: Simple function with annotations

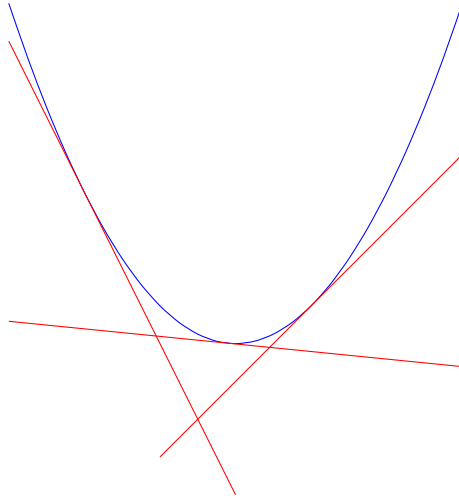


```

\definecolor{cof}{RGB}{219, 144, 71}
\begin{tikzpicture}[
  spy using outlines={cof, magnification=2, size=4cm, connect spies}
]
  \draw[-latex] (-3, 0) -- (3, 0) node[right] {$x$};
  \draw[-latex] (0, 0) -- (0, 4.5) node[above] {$f(x)$};
  \draw[
    domain=-3:3,
    smooth,
    variable=\x,
    blue] plot ({\x}, {\x * \x / 2.0});
  \node[red] at (-2, 2) {\textbullet};
  \draw[red] (-3, 4) -- (0, -2);
  \draw[dotted] (-3, 2) -- (3, 2);
  \spy on (-2, 2) in node[fill=white] at (3, 3);
\end{tikzpicture}

```

Figure 3: plot-03.tex: Function with zoom without Pgfplots

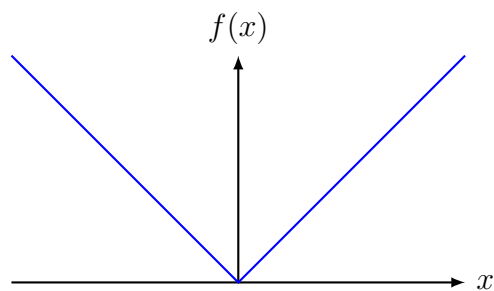


```

\begin{tikzpicture}
  \draw[
    domain=-3:3,
    smooth,
    variable=\x,
    blue
  ] plot ({\x}, {\x * \x / 2.0});
  \draw[red] (-3, 4) -- (0, -2) ;
  \draw[red] (-1, -1.5) -- (3, 2.5) ;
  \draw[red] (-3, 0.295) -- (3, -0.305) ;
\end{tikzpicture}

```

Figure 4: plot-04.tex: Function with tangents without Pgfplots

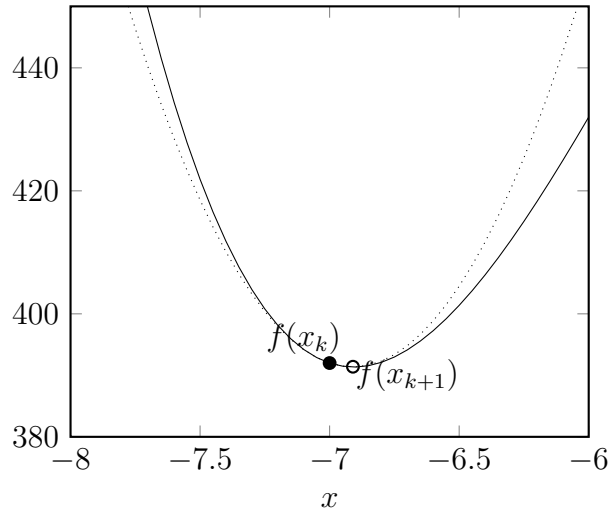


```

\begin{tikzpicture}[thick, scale=3]
  \draw[-latex] (-1, 0) -- (1, 0) node[right] {$x$};
  \draw[-latex] (0, 0) -- (0, 1) node[above] {$f(x)$};
  \draw[domain=-1:1, variable=\x, blue] plot ({\x}, {abs(\x)});
\end{tikzpicture}

```

Figure 5: plot-05.tex: Absolute value without Pgfplots

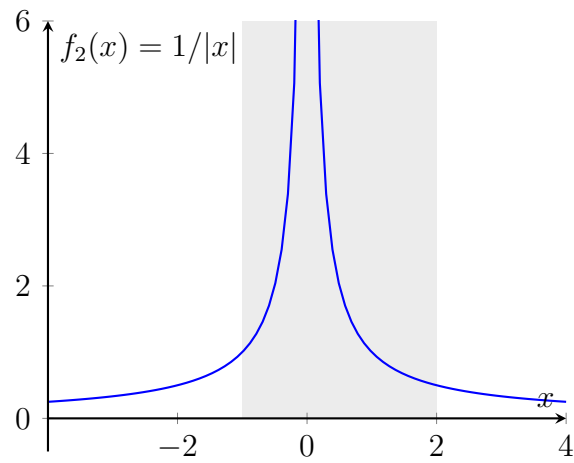


```

\begin{tikzpicture}
\begin{axis}[
  xlabel={x},
  samples=41,
  thick,
  domain=-8:-6,
  xmin=-8,
  xmax=-6,
  ymin=380,
  ymax=450,
]
\addplot+ [
  mark=none,
  mark color=black,
  color=black,
  thin
] {2 * x^4 + 30 * x^3 + 120 * x^2 };
\addplot+ [
  mark=none,
  mark color=black,
  color=black,
  thin,
  dotted
] {392 + (x + 7) * (-14) + 0.5 * (x + 7) * 156 * (x + 7)};
\node at (-7.1, 396) {$f(x_k)$};
\node at (-6.7, 390) {$f(x_{k+1})$};
\draw (-7, 392) circle[radius=2.2pt];
\fill (-7, 392) circle[radius=2.2pt];
\draw (-6.91, 391.4) circle[radius=2.2pt];
\end{axis}
\end{tikzpicture}

```

Figure 6: plot-06.tex: Annotated functions

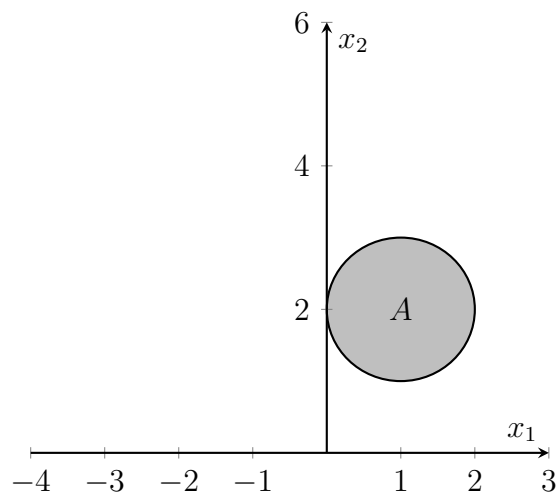


```

\begin{tikzpicture}
\begin{axis}[
  xlabel={$x$},
  ylabel={$f_2(x)=1/|x|$},
  axis on top=true,
  axis lines=middle,
  samples=41,
  thick,
  xmin=-4,
  xmax=4,
  ymin=-0.5,
  ymax=6,
  axis y line=left,
]
\fill[
  fill=gray!15,
  fill opacity=0.2,
  draw=none
] (-1,0) rectangle (2,6) ;
\addplot+ [
  domain=-4:-0.1,
  no marks,
  blue,
] {1/abs(x)};
\addplot+ [
  domain=0.1:4,
  no marks,blue
] {1/abs(x)};
\end{axis}
\end{tikzpicture}

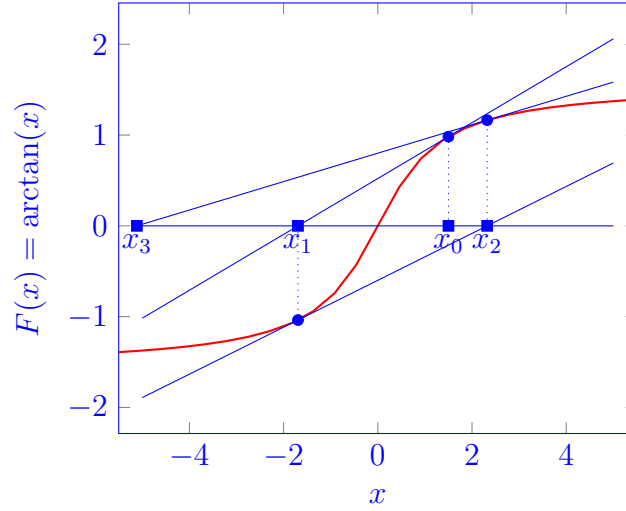
```

Figure 7: plot-07.tex: Function with area



```
\begin{tikzpicture}
\begin{axis}[
  xlabel={$x_1$},
  ylabel={$x_2$},
  axis on top=true,
  axis lines=middle,
  samples=41,
  thick,
  domain=-4:4,
  xmin=-4,
  xmax=3,
  ymin=0,
  ymax=6,
]
\draw[fill=gray!50] (1,2) circle [radius=1];
\node at (axis cs:1,2) {$A$}; \end{axis}
\end{tikzpicture}
```

Figure 8: plot-08.tex: Circle

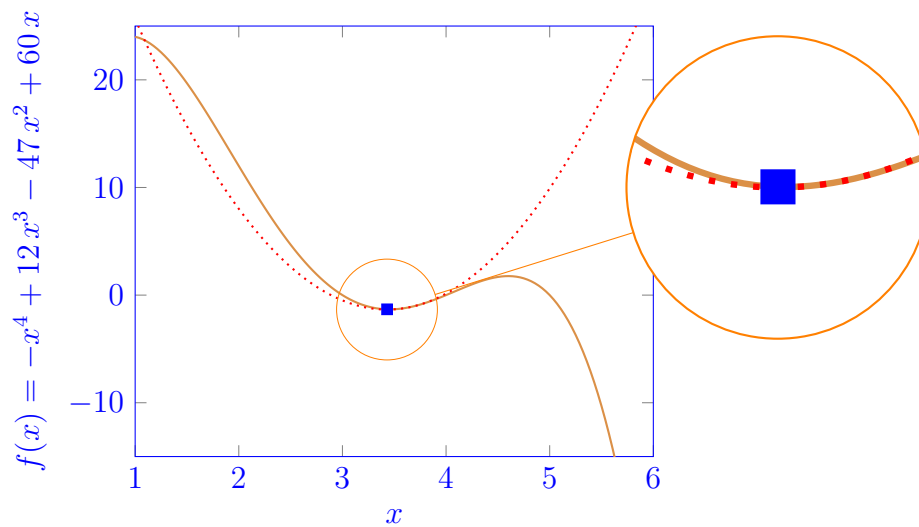


```

\begin{tikzpicture}[blue]
  \begin{axis}[
    domain=-5.5:5.5,
    xmin=-5.5,
    xmax=5.5,
    xlabel=$x$,
    ylabel={$F(x)=\arctan(x)$},
  ]
    \addplot[thick, red, mark=none] {rad(atan(x))};
    \addplot[mark=none] coordinates {(-5, 0) (5, 0)};
    % x0
    \addplot[mark=square*] coordinates {(1.5, 0)};
    \addplot[dotted, mark=none] coordinates {(1.5, 0) (1.5, 0.9828)};
    \addplot[mark=*] coordinates {(1.5, 0.9828)};
    \node at (axis cs: 1.5, -0.2) {$x_0$};
    % Tangent
    \addplot[mark=none] coordinates {(-5, -1.017) (5, 2.0597)};
    \addplot[mark=square*] coordinates {(-1.6940796, 0)};
    % Next iterate
    \addplot[dotted, mark=none] coordinates {
      (-1.6940796, 0) (-1.69407960055382, -1.03754635913789)
    };
    \addplot[mark=*] coordinates {(-1.69407960055382, -1.03754635913789)};
    \node at (axis cs: -1.69407960055382, -0.2) {$x_1$};
    % Tangent
    \addplot[mark=none] coordinates {
      (-5, -1.89181017373556) (5, 0.692232124260424)
    };
    \addplot[mark=square*] coordinates {(2.32112696143839, 0)};
    % Next iterate
    \addplot[dotted, mark=none] coordinates {
      (2.32112696143839, 0) (2.32112696143839, 1.16400204242198)
    };
    \addplot[mark=*] coordinates {(2.32112696143839, 1.16400204242198)};
    \node at (axis cs: 2.32112696143839, -0.2) {$x_2$};
    % Tangent
    \addplot[mark=none] coordinates {
      (-5, 0.017860744931861) (5, 1.58338652194274)
    };
    \addplot[mark=square*] coordinates {(-5.11408783677751, 0)};
    \node at (axis cs: -5.11408783677751, -0.2) {$x_3$};
  \end{axis}
\end{tikzpicture}

```

Figure 9: plot-09.tex: Iterations

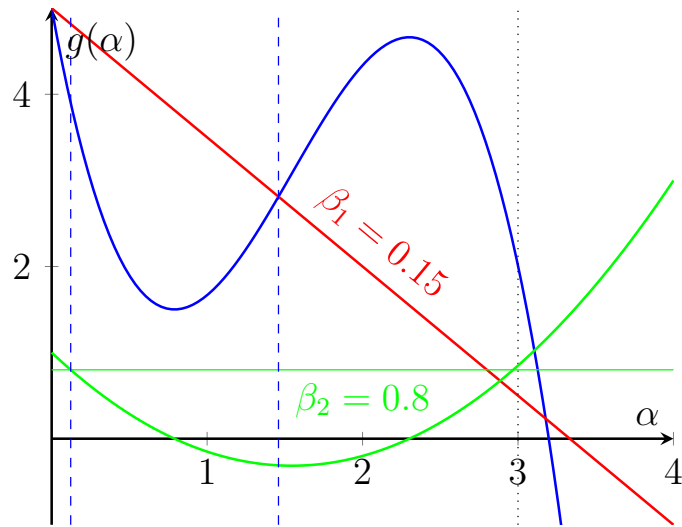


```

\definecolor{cof}{RGB}{219,144,71}
\begin{tikzpicture}[
  spy using outlines={blue, circle, magnification=3, size=4cm, connect spies},
  blue
]
\begin{axis}[
  domain=1:6,
  xmin=1,
  xmax=6,
  ymin=-15,
  ymax=25,
  samples=141,
  xlabel=$x$,
  ylabel={$f(x) = -x^4 + 12x^3 - 47x^2 + 60x$},
]
\addplot[thick, cof, mark=none] {-x^4 + 12 * x^3 - 47 * x^2 + 60 * x};
\addplot[
  thick,
  dotted,
  red,
  mark=none] {-1.14746260501326+(x-3.63636363636363)*1.8782870022539555+0.5*(x-3.63636363636363)^2*9.140495867768607};
\addplot[mark=square*] coordinates {(3.430872924543809, -1.3201436784795249)};
\addplot[thick, blue, mark=none] coordinates {(3.430872924543809, -1.3201436784795249)};
\coordinate (spypoint) at (axis cs:3.43, -1.340);
\coordinate (magnifyglass) at (axis cs:7.2, 10);
\end{axis}
\spy[orange] on (spypoint) in node[fill=white] at (magnifyglass);
\end{tikzpicture}

```

Figure 10: plot-10.tex: Zoom on function

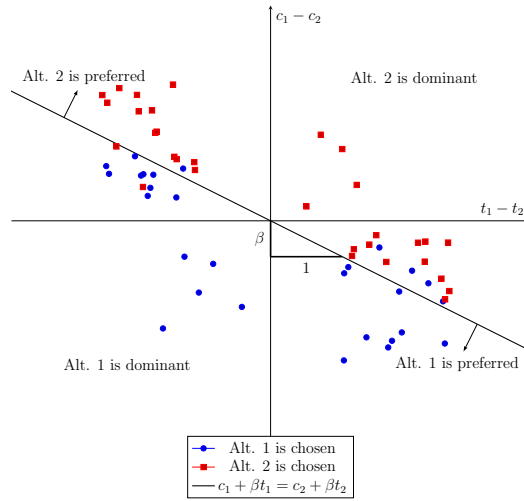


```

\begin{tikzpicture}[scale=1.2]
\begin{axis}[
xlabel={\alpha},
ylabel={g(\alpha)},
axis y line=middle,
axis x line=middle,
samples=120,
thick,
xmin=0,
xmax=4,
domain=0:4,
ymin=-1,
ymax=5
]
\addplot+[mark=none, color=blue, thick]{-1.833 * x*x*x + 8.5 * x * x - 10 * x + 5};
\addplot+[mark=none, color=red, thick]{5-0.15*10*x} node[pos=0.5, above, sloped] (A) {\beta_1=0.15$};
\addplot+[mark=none, color=black, thin, dotted] coordinates {(3, -1) (3, 5)};
\addplot+[mark=none, color=green, thick, domain=0:4]{(-1.833*3*x*x + 2*8.5 * x -10)/-10};
\addplot+[mark=none, color=green, thin] coordinates {(0, 0.8) (4, 0.8)}
node[pos=0.5, below] (B) {\beta_2=0.8$};
\addplot+[mark=none, color=blue, thin, dashed] coordinates {(0.1225, -1) (0.1225, 5)};
\addplot+[mark=none, color=blue, thin, dashed] coordinates {(1.45912, -1) (1.45912, 5)};
\end{axis}
\end{tikzpicture}

```

Figure 11: plot-11.tex: Multiple plots

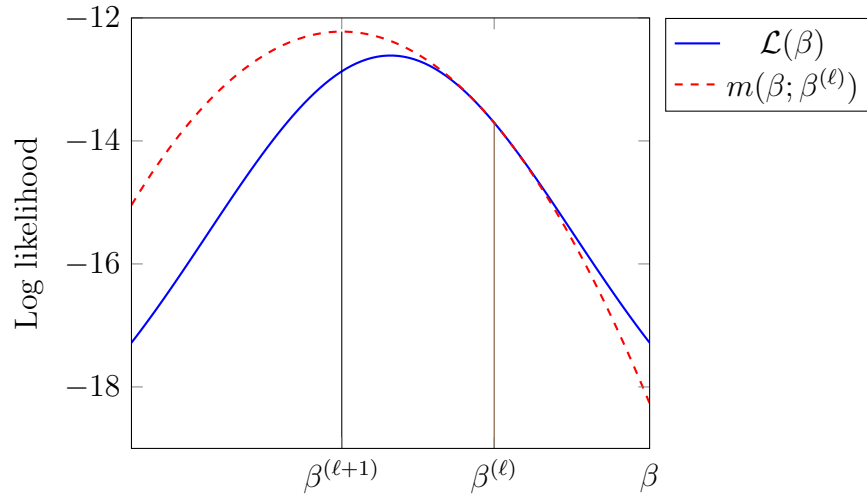


```

\begin{tikzpicture}[scale=0.5]
\begin{axis}[
  xlabel={\mathit{t}_1-\mathit{t}_2},
  ylabel={\mathit{c}_1-\mathit{c}_2},
  axis equal,
  axis lines=center,
  axis on top,
  xtick=\empty,
  ytick=\empty,
  xmin=-3.5,
  xmax=3.5,
  ymin=-3,
  ymax=3,
  legend style={
    at={(axis cs:0, -3)},
    anchor=north,
  },
  scale=2,
]
\addplot table [
  x index=0,
  y index=1,
  col sep=space,
  only marks,
] {fig-BAL32a.dat};
\addlegendentry{Alt. 1 is chosen};
\addplot table [
  x index=0,
  y index=1,
  col sep=space,
  only marks,
] {fig-BAL32b.dat};
\addlegendentry{Alt. 2 is chosen};
\addplot [
  mark=none,
  thick,
] {-x/2};
\addlegendentry{\mathit{c}_1+\beta \mathit{t}_1 = \mathit{c}_2+\beta \mathit{t}_2};
\draw[very thick] (0, 0) -- (0, -0.5) node[midway, left] {\mathit{\beta}};
\draw[very thick] (0, -0.5) -- (1, -0.5) node[midway, below] {1};
\node at (axis cs:2, 2) {Alt. 2 is dominant};
\node at (axis cs:-2, -2) {Alt. 1 is dominant};
\node (A) at (3, -1.5) {};
\node (B) at (-3, 1.5) {};
\node (P) at (-2.6, 2) {Alt. 2 is preferred};
\node (Q) at (2.6, -2) {Alt. 1 is preferred};
\draw[-latex] (A)!(P)!(B) -- (P);
\draw[-latex] (A)!(Q)!(B) -- (Q);
\end{axis}
\end{tikzpicture}

```

Figure 12: plot-12.tex: Line and data



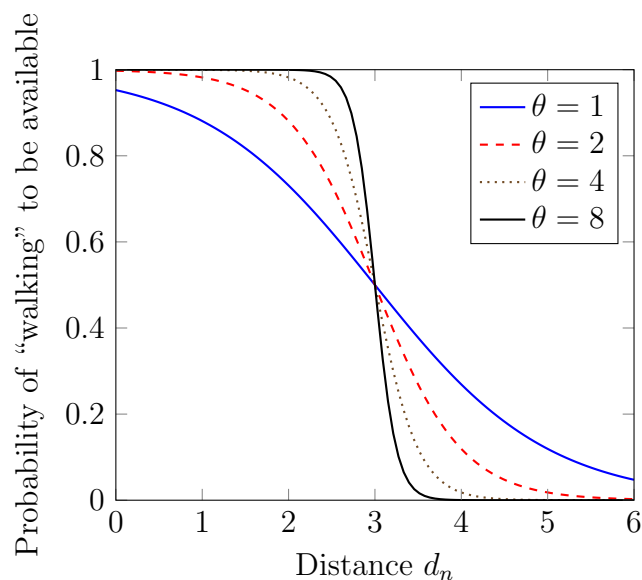
```

\begin{tikzpicture}[
  declare function = {
    f(\x) = exp(-\x * \x + 2) - 20 ;
    g(\x) = -2 * \x * exp(-\x*\x + 2) ;
    h(\x) = exp(-\x*\x + 2) * (4*\x*\x - 2) ;
    m(\x,\xk) = f(\xk) + (\x-\xk) * g(\xk) + 0.5 * (\x-\xk) * (\x-\xk) * h(\xk) ;
    xk = 0.4;
    fxk = f(xk) ;
    xkpl = xk - g(xk) / h(xk) ;
    mxkpl = m(xkpl, xk) ;
  }
]
\begin{axis}[
  xlabel={\beta},
  xlabel style={at={axis description cs:1, -0.01}}},
  ylabel={Log likelihood},
  samples=100,
  domain=-1:1,
  xmin=-1,
  xmax=1,
  ymin=-19,
  ymax=-12,
  axis on top,
  xtick={xkpl, xk},
  xticklabels={\beta^{(\ell+1)}}, {\beta^{(\ell)}}},
  legend pos=outer north east,
]

\addplot+[no marks, thick] {f(x)};
\addlegendentry{\mathcal{L}(\beta)}
\addplot+[no marks, thick, dashed] {m(x, 0.4)};
\addlegendentry{m(\beta; \beta^{(\ell)})}
\addplot+[mark=none] coordinates {
  (0.4, -19.0) (0.4, fxk)
};
\addplot+[mark=none] coordinates {
  (xkpl, -19.0) (xkpl, mxkpl)
};
\end{axis}
\end{tikzpicture}

```

Figure 13: plot-13.tex: Function definition

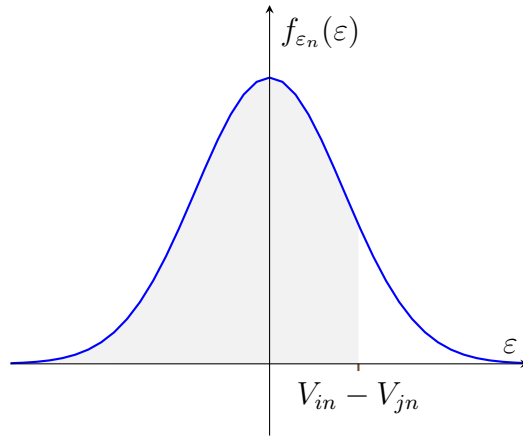


```

\begin{tikzpicture}[
  declare function = {
    f(\x,\theta) = 1 / (1 + exp(\theta*(\x - 3))) ;
  }
]
\begin{axis}[
  xlabel={Distance $d_n$},
  ylabel={Probability of ``walking'' to be available},
  samples=100,
  domain=0:6,
  xmin=0,
  xmax=6,
  ymin=0,
  ymax=1,
  axis on top,
  legend pos=north east,
]
\addplot+[no marks, thick] {f(x, 1)};
\addlegendentry{$\theta=1$}
\addplot+[no marks, thick, dashed] {f(x, 2)};
\addlegendentry{$\theta=2$}
\addplot+[no marks, thick, dotted] {f(x, 4)};
\addlegendentry{$\theta=4$}
\addplot+[no marks, thick] {f(x, 8)};
\addlegendentry{$\theta=8$}
\end{axis}
\end{tikzpicture}

```

Figure 14: plot-14.tex: Function parameterized definition

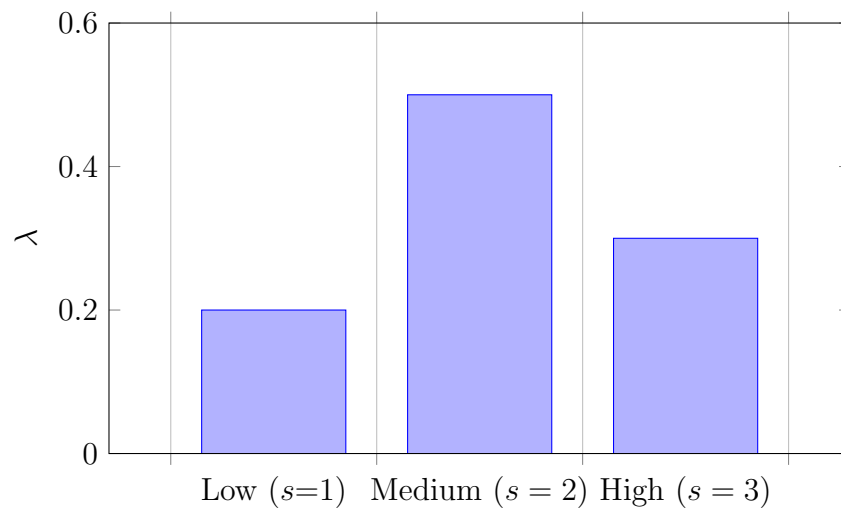


```

\begin{tikzpicture}
\begin{axis}[
  xlabel={\varepsilon},
  ylabel={f_{\varepsilon_n}(\varepsilon)},
  axis lines=center,
  samples=41,
  domain=-3.5:3.5,
  xmin=-3.5,
  xmax=3.5,
  ymin=-0.1,
  ymax=0.5,
  axis on top,
  ticks=none,
]
\addplot+[name path=f, no marks, thick] (0.398942280401433 * exp(-0.5 * x^2));
\path[name path=axis] (axis cs:0, 0) -- (axis cs:1.2, 0);
\addplot [
  color=gray!10,
  fill=gray!10,
]
fill between[
  of=f and axis,
  soft clip={domain=-3.5:1.2},
];
\addplot+[mark=none, thick] coordinates {(1.2, -0.01) (1.2, 0)};
\node [below] at (axis cs:1.2, -0.01) {$V_{in}-V_{jn}$};
\end{axis}
\end{tikzpicture}

```

Figure 15: plot-15.tex: Function with area under the curve

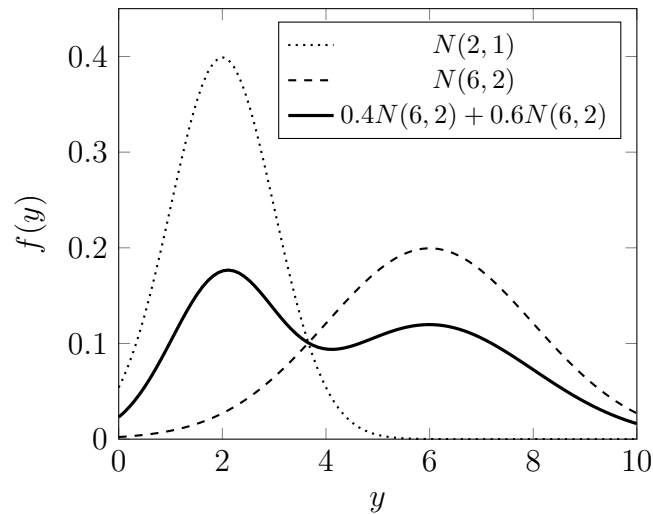


```

\begin{tikzpicture}
\begin{axis}[
area style,
ybar interval = 0.7,
ymin = 0,
ymax = 0.6,
xtick=data,
x=15ex,
ylabel=$\lambda$,
symbolic x coords={Low ($s=1$), Medium ($s=2$), High ($s=3$), Last},
]
\addplot plot coordinates {(Low ($s=1$), 0.2) (Medium ($s=2$),
0.5) (High ($s=3$), 0.3) (Last, 0.3) };
\end{axis}
\end{tikzpicture}

```

Figure 16: plot-16.tex: Histogram with symbolic x -coordinates

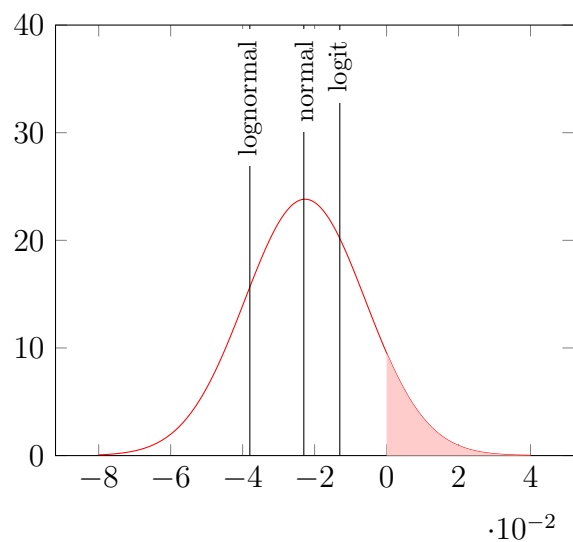


```

\tikzset{
  declare function={
    normpdf(\x,\mu,\sigma)=1/(\sigma * sqrt(2 * pi)) * exp(-((\x - \mu)^2)/(2 * \sigma^2));
  }
}
\begin{tikzpicture}
\begin{axis}[
  samples=100,
  domain=0:10,
  xmin=0,
  xmax=10,
  ymin=0,
  ymax=0.45,
  xlabel={y},
  ylabel={f(y)},
  legend pos=north east
]
\addplot[dotted, thick] {normpdf(x, 2, 1)};
\addplot[dashed, thick] {normpdf(x, 6, 2)};
\addplot[very thick] {0.4 * normpdf(x, 2, 1) + 0.6 * normpdf(x, 6, 2)};
\addlegendentry{\footnotesize $N(2, 1)$};
\addlegendentry{\footnotesize $N(6, 2)$};
\addlegendentry{\footnotesize $0.4 N(2, 1) + 0.6 N(6, 2)$};
\end{axis}
\end{tikzpicture}

```

Figure 17: plot-17.tex: Mixture of normal distributions

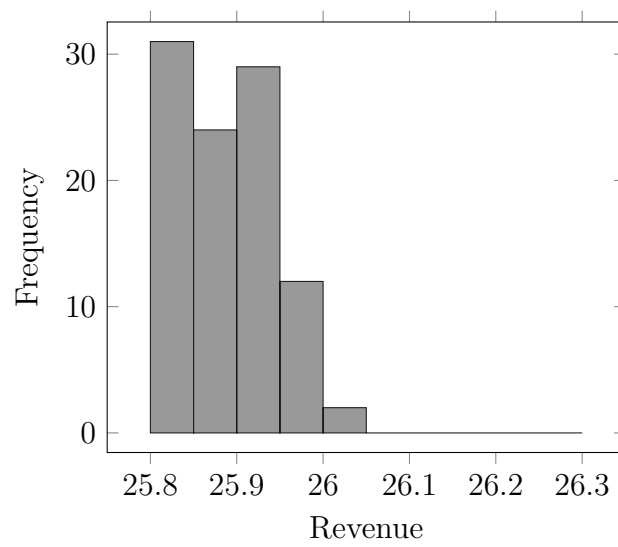


```

\tikzset{
  declare function={
    normpdf(\x,\mu,\sigma)=1/(\sigma * sqrt(2 * pi)) * exp(-((\x - \mu)^2)/(2 * \sigma^2));
    lognormpdf(\x,\mu,\sigma)=1/(\x*\sigma*sqrt(2*pi))*exp(-((ln(\x)-\mu)^2)/(2*\sigma^2));
  }
}
\begin{tikzpicture}
  \begin{axis}[ymin=0, ymax=40]
    \addplot[
      red,
      domain=-0.08:0.04,
      samples=201,
    ] {
      normpdf(x, -2.2657162e-002, 1.6749028e-002)
    };
    \addplot[fill=red!20, draw=none, domain=0:0.04] {
      normpdf(x, -2.2657162e-002, 1.6749028e-002)
    } \closedcycle;
    \addplot[
      blue,
      domain=-0.08:-0.0001,
      samples=201,
    ] {
      -lognormpdf(x, -4.0326920, 1.2417319)
    };
    \tikzstyle{my node}=[
      pos=.99, anchor=right, rotate=90, font=\footnotesize, fill=white
    ]
    \draw[-] (-0.013, 0) -- node[my node]{logit} (-0.013, 40);
    \draw[-] (-0.023, 0) -- node[my node]{normal} (-0.023, 40);
    \draw[-] (-0.038, 0) -- node[my node]{lognormal} (-0.038, 40);
  \end{axis}
\end{tikzpicture}

```

Figure 18: plot-18.tex: Normal distribution with area under the curve

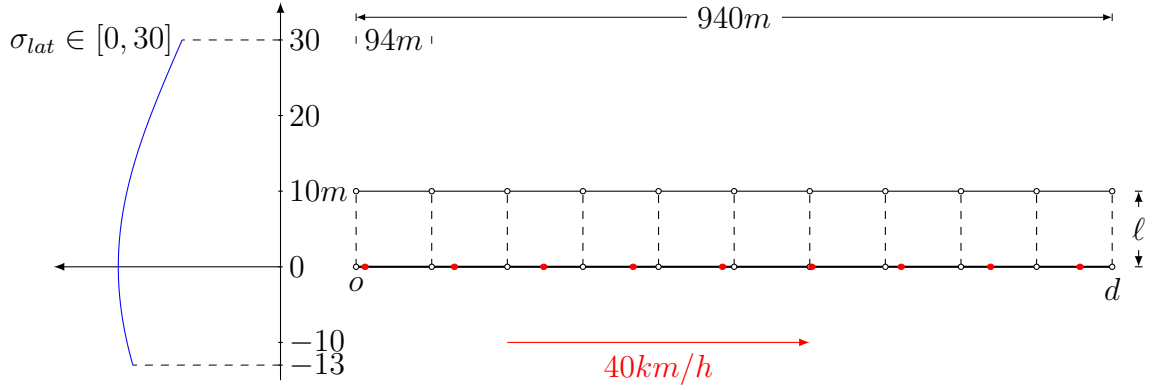


```

\begin{tikzpicture}
\begin{axis}[
  ybar,
  ymin=0,
  xlabel=Revenue,
  ylabel = Frequency,
  enlarge y limits=0.05
]
\addplot+[gray!20!black, fill=gray!80!white,
hist={
  bins=10,
  data min=25.8,
  data max=26.3,
}]
table [y index=0] {revenues.csv};
\end{axis}
\end{tikzpicture}

```

Figure 19: plot-19.tex: Histogram

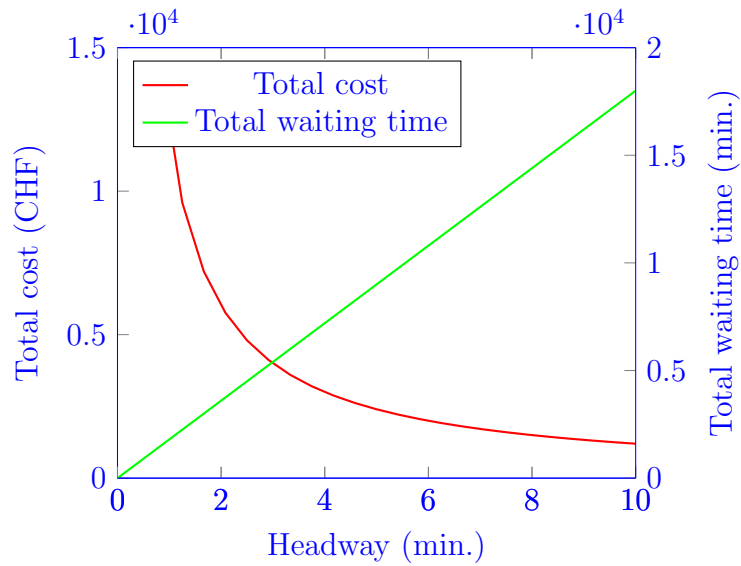


```

\begin{tikzpicture}[scale = 1]
\draw[thick] (0, 0) -- (10, 0);
\draw (0, 1) -- (10, 1);
\draw[latex-latex] (10.35, 0) -- node[fill=white]{$\ell$} (10.35, 1);
\draw (10.3, 0) -- (10.4, 0);
\draw (10.3, 1) -- (10.4, 1);
\node at (0, 0)[below] {$o$};
\node at (10, 0)[below] {$d$};
\foreach \x in {0, ..., 10}{
\draw[dashed] (\x, 0) -- (\x, 1);
\filldraw[fill=white, draw=black] (\x, 0) circle (1pt);
\filldraw[fill=white, draw=black] (\x, 1) circle (1pt);
}
\begin{scope}[yshift=1.7cm]
\draw[latex-latex, very thin] (0, 1.3) -- node[fill=white]{$94m$} (1, 1.3);
\draw[very thin] (0, 1.25) -- (0, 1.35);
\draw[very thin] (1, 1.25) -- (1, 1.35);
\draw[latex-latex, very thin] (0, 1.6) -- node[fill=white]{$940m$} (10, 1.6);
\draw[very thin] (0, 1.65) -- (0, 1.55);
\draw[very thin] (10, 1.65) -- (10, 1.55);
\end{scope}
\begin{scope}[xshift=0.11820331cm, xscale=1.182033097]
\foreach \x in {0, ..., 8}{
\filldraw[fill=red, draw=red] (\x, 0) circle (1pt);
}
\end{scope}
\begin{scope}[xshift=-1cm, xscale=10]
\draw[-latex] (0, -1.5) -- (0, 3.5);
\draw[-latex] (0, 0) -- (-0.3, 0);
\draw[dashed, very thin] (0, -1.3) -- (-0.195319437, -1.3);
\draw[dashed, very thin] (0, 3) -- (-0.130128867, 3);
\foreach \y/\ytext in {-1.3/-13, -1/-10, 0/0, 1/10m, 2/20, 3/30}{
\draw (0.003, \y) -- (-0.003, \y) node[right] {$\ytext$};
}
\draw[domain=-1.3:3, smooth, color=blue]
plot[parametric, id=parametric-example] function{-0.214546231 * exp(- t*t/(2*3*3)), t};
\draw (-0.25, 3) node{$\sigma_{lat}$ \in [0, 30]};
\end{scope}
\begin{scope}[yshift=-1cm]
\draw[-latex, color=red] (2, 0) -- (6, 0) node[midway, below]{$40km/h$};
\end{scope}
\draw plot[only marks, mark=x, mark options = {draw=red}] file {gps.table};
\end{tikzpicture}

```

Figure 20: plot-20.tex: Annotated data, using scope



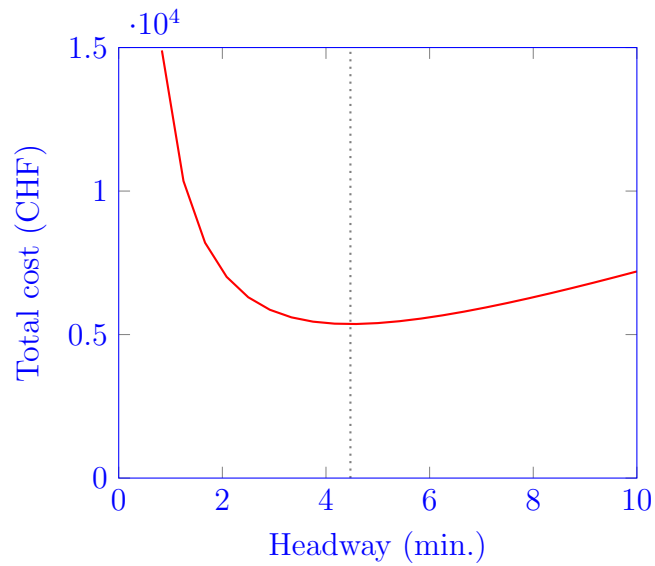
```

\begin{tikzpicture}[
  blue,
  declare function = {
    cost(\x) = \T * \r / \x ;
    waiting(\x) = \T * \x * \f / 2 ;
  }
]
\def \T{60}
\def \f{60}
\def \r{200}
\begin{axis}[
  xlabel={Headway (min.)},
  ylabel={Total cost (CHF)},
  axis y line* = left, % the '*' avoids arrow heads
  domain=0:10,
  xmin=0,
  xmax=10,
  ymin=0,
  ymax=15000,
  restrict y to domain=0:15000,
  axis on top,
]
\addplot+[red, thick, no marks] {cost(x)}; \label{plot_cost}
\end{axis}

\begin{axis}[
  ylabel={Total waiting time (min.)},
  axis y line* = right, % the '*' avoids arrow heads
  domain=0:10,
  xmin=0,
  xmax=10,
  ymin=0,
  ymax=20000,
  axis on top,
  legend pos=north west,
]
\addlegendimage{/pgfplots/refstyle=plot_cost}\addlegendentry{Total
cost}
\addplot+[green, thick, no marks] {waiting(x)};
\addlegendentry{Total waiting time}
\end{axis}
\end{tikzpicture}

```

Figure 21: plot-21.tex: Double y axis and legend



```

\begin{tikzpicture}[
  blue,
  declare function = {
    cost(\x) = \T * \r / \x ;
    waiting(\x) = \T * \x * \f / 2 ;
  }
]
\def \T{60}
\def \f{60}
\def \r{200}
\def \W{1/3}
\begin{axis}[
  xlabel={Headway (min.)},
  ylabel={Total cost (CHF)},
  domain=0:10,
  xmin=0,
  xmax=10,
  ymin=0,
  ymax=15000,
  restrict y to domain=0:15000,
  axis on top,
]
\addplot+[red, thick, no marks] {cost(x) + 20 * waiting(x) / 60};
\draw[-, thick, dotted, gray] {
  ((2 * \r / (\f * \W))^0.5), 0) --
  ((2 * \r / (\f * \W))^0.5), \pgfkeysvalueof{/pgfplots/ymax})
};
\end{axis}
\end{tikzpicture}

```

Figure 22: plot-22.tex: Parametrized plot