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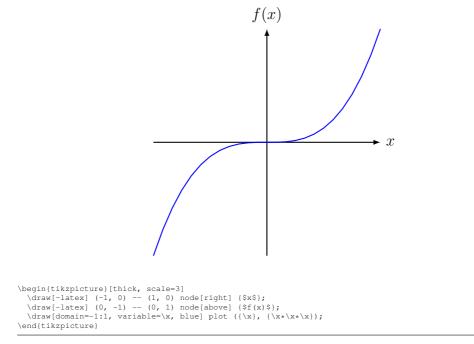


Figure 1: plot-02.tex: Simple function without Pgfplots

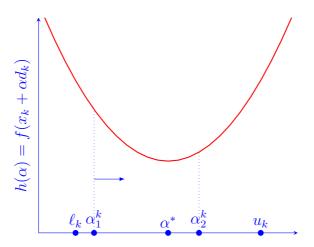
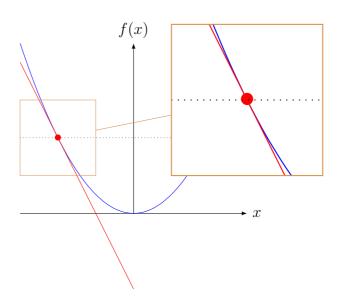


Figure 2: plot-01.tex: Simple function with annotations

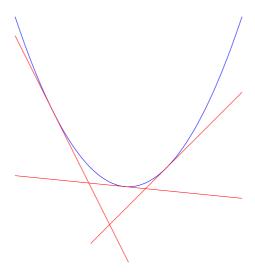


```
\definecolor{cof}{RGB}{219, 144, 71}
\begin{tikzpicture}[
    spy using outlines={cof, magnification=2, size=4cm, connect spies}]

    \draw[-latex] (-3, 0) -- (3, 0) node[right] {$x$};
    \draw[-latex] (0, 0) -- (0, 4.5) node[above] {$f(x)$};

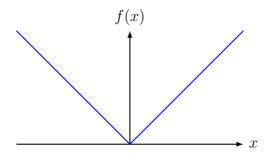
    \draw[
        domain=-3:3,
        smooth,
        variable=\x,
        blue] plot ({\x}, {\x * \x / 2.0});
    \node[red] at (-2, 2) {\textbullet};
    \draw[red] (-3, 4) -- (0, -2);
    \draw[dotted] (-3, 2) -- (3, 2);
    \spy on (-2, 2) in node[fill=white] at (3, 3);
\end{tikzpicture}
```

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

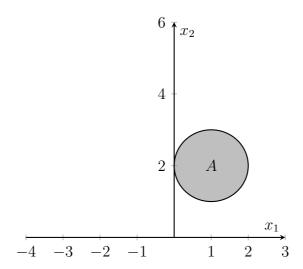
```
420 - 420 - 420 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400 - 400
```

```
\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,
        thin
] {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];
    \end{axis}
end{tikzpicture}
```

Figure 6: plot-06.tex: Annotated functions

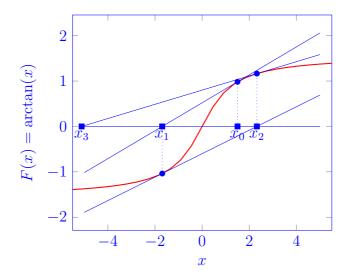
```
\begin{axis}
  xlabel={$x$},
  ylabel={$f_2(x)=1/|x|$},
  axis on top=true,
  axis lines=middle,
  samples=41,
  thick,
  xmin=-4,
  xmax=4,
  ymin=-0.5,
  ymax=6,
  axis y line=left,
]
  \fill[
  fill=gray!15,
  fill opacity=0.2,
  draw=none
] (-1,0) rectangle (2,6);
  \addplot+[
  domain=-4:-0.1,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

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) = \langle x \rangle },
      |
\addplot[thick, red, mark=none] {rad(atan(x))};
\addplot[mark=none] coordinates {(-5, 0) (5, 0)};
      \ \text{Addplot[mark=square*] coordinates \( (1.5, 0) \);
\ \text{addplot[dotted, mark=none] coordinates \( (1.5, 0) \) \( (1.5, 0.9828) \);
\ \text{addplot[mark=*] coordinates \( (1.5, 0.9828) \);
\}

      \node at (axis cs: 1.5, -0.2) \{x_0\}; 
% Tangent
      % Next iterate
      % Medi lectate

| dadplot[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
      % 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
      * langent
\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

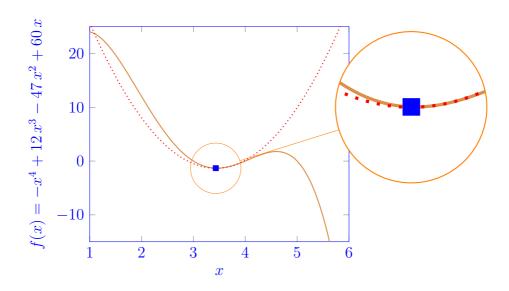


Figure 10: plot-10.tex: Zoom on function

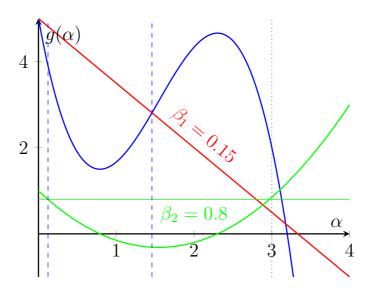
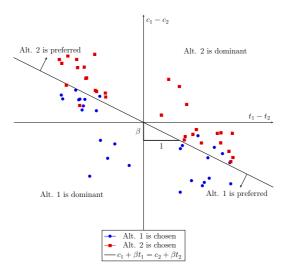


Figure 11: plot-11.tex: Multiple plots



```
\begin{tikzpicture}[scale=0.5]
     \begin{axis}[
  xlabel={$t_1-t_2$},
  ylabel={$c_1-c_2$},
  axis equal,
  axis lines=center,
                  axis lines=center,
axis on top,
xtick=\empty,
ytick=\empty,
xmin=-3.5,
ymax=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,
            col sep-space,
only marks,
] {fig-BAL32a.dat};
\addlegendentry{Alt. 1 is chosen};
             \addplot table[
                  x index=0,
y index=1,
            y index=1,
col sep=space,
only marks,
] {fig-BAL32b.dat};
\addlegendentry{Alt. 2 is chosen};
             \addplot[
                  mark=none,
            thick, ] {-x/2};
           ]{-x/2};
\addlegendentry{$c_1+\beta t_1 = c_2+\beta t_2$}
\draw[very thick] (0, 0) -- (0, -0.5) node[midway, left] {$\beta$};
\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 (B) 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

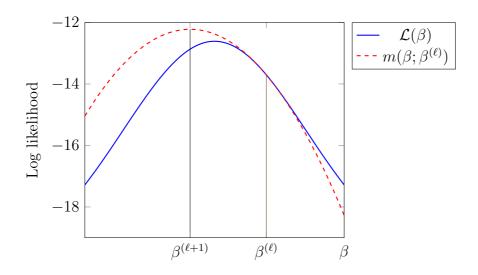
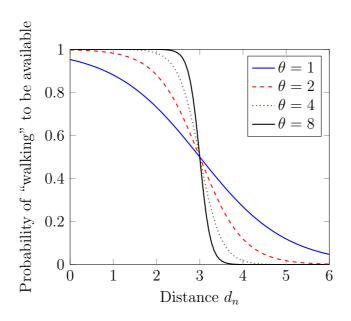


Figure 13: plot-13.tex: Function definition



```
\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,
        ymin=0,
        ymin=0,
        ymax=1,
        axis on top,
        legend pos=north east,
    }
    \addplot+[no marks, thick] {f(x, 1)};
    \addlegendentry($\theta=1$)
    \addlegendentry($\theta=2$)
    \addplot+[no marks, thick, dashed] {f(x, 2)};
    \addlegendentry($\theta=2$)
    \addlegendentry($\theta=2$)
    \addlegendentry($\theta=4$)
    \addlegendentry($\theta=4$)
    \addlegendentry($\theta=4$)
    \addlegendentry($\theta=8$)
    \end(axis)
\end(tikzpicture)
```

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

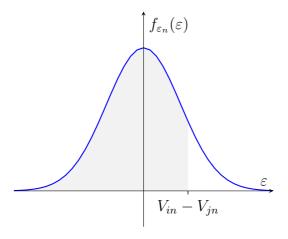


Figure 15: plot-15.tex: Function with area under the curve

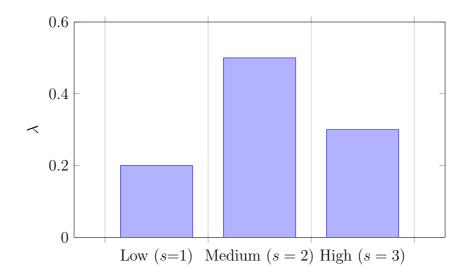
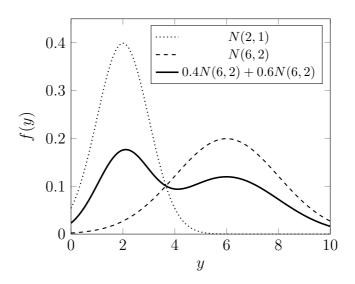
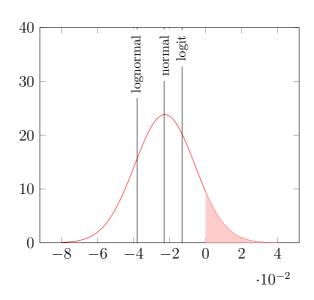


Figure 16: plot-16.tex: Histogram with symbolic x-coordinates



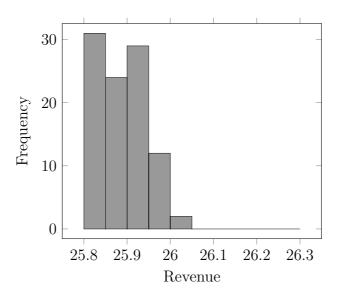
```
\tikzset{
  declare function={
    normpdf(\x,\mu,\sigma)=1/(\sigma * sqrt(2 * pi)) * exp(-((\x - \mu)^2)/(2 * \sigma^2));
  }
}
begin{tikzpicture}
  begin{axis}{
    samples=100,
    domain=0:10,
    xmin=0,
    ymax=10,
    ymin=0,
    ymax=0.45,
    xlabel={$y$},
    ylabel={$f(y)$},
    legend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

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



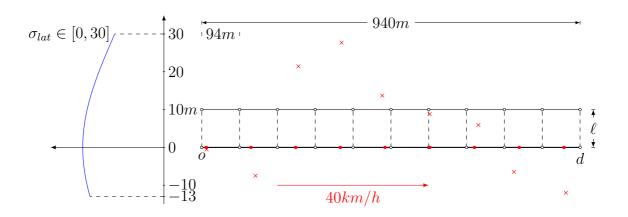
```
\tikzset{
    declare function={
          \begin{array}{ll} \operatorname{control}((x, \operatorname{lmu}, \operatorname{sigma}) = 1/(\operatorname{sigma} * \operatorname{sqrt}(2 * \operatorname{pi})) * \exp(-((\operatorname{ln} - \operatorname{lmu}^2)/(2 * \operatorname{sigma}^2)); \\ \operatorname{lognormpdf}((x, \operatorname{lmu}, \operatorname{sigma}) = 1/(\operatorname{ln} \operatorname{sigma} * \operatorname{sqrt}(2 * \operatorname{pi})) * \exp(-((\operatorname{ln} (\operatorname{ln} - \operatorname{lmu})^2)/(2 * \operatorname{sigma}^2)); \\ \end{array} 
\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)
        httmpd(x, -2);
};
\addplot[fill=red!20, draw=none, domain=0:0.04] {
    normpdf(x, -2.2657162e-002, 1.6749028e-002)
} \closedcycle;
\addplot[
         \addplot[
            blue,
domain=-0.08:-0.0001,
             samples=201,
        ] {
    -lognormpdf(x, -4.0326920, 1.2417319)
         \tikzstyle{my node}=[
            pos=.99, anchor=east, 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



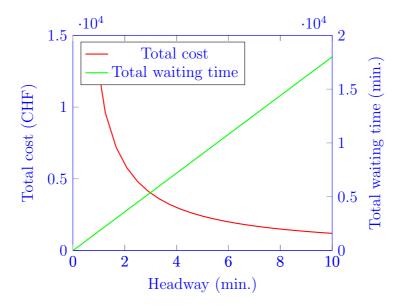
```
\begin{tikzpicture}
\begin{axis}[
   ybar,
   ymin=0,
   xlabel=Revenue,
   ylabel = Frequency,
   enlarge y limits=0.05
]
\addplot+[gray!20!black, fill=gray!80!white,
   hist={
      bins=10,
      data min=25.8,
      data max=26.3,
   }
] table [y index=0] {revenues.csv};
\end{tikzpicture}
```

Figure 19: plot-19.tex: Histogram



```
| begin(tikzpicture)|scale = 1|
| draw[ thick] (0, 0) -- (10, 0);
| draw[ draw (0, 1) -- (10, 1) ;
| draw[ draw (10.3, 0) -- (10.4, 0);
| draw[ draw (10.3, 0) -- (10.4, 0);
| draw (10.3, 1) -- (10.4, 1);
| node at (0, 0)[below] |scs];
| node at (10, 0)[below] |scs];
| node at (10, 0)[below] |scs];
| 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);
| 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](1, 1.25) -- (0, 1.35);
| draw [very thin](0, 1.25) -- (0, 1.35);
| draw [very thin](0, 1.65) -- (0, 1.55);
| draw [very thin](0, 1.65) -- (10, 1.55);
| begin[scope][xshift=0.11820331cm, xscale=1.182033097]
| begin[scope][xshift=0.11820331cm, xscale=1.182033097]
| foreach \x in (0, ..., 8){
| filldraw[fill=red, draw=red] (\x, 0) circle (1pt);
| }
| lend[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) -- (-0.19519437, -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] {$\text{ytext}$};
| draw[domain=-1.3:, smooth, color=blue]
| plot[parametric, id=parametric-example] function[-0.214546231 * exp(- t*t/(2*3*3)), t];
| draw[-latex] (0, color=red] (2, 0)--(6, 0) node[midway, below]{$40km/h$};
| lend[scope]
| begin[scope][yshift=-1cm]
| draw [-latex, color=red] (2, 0)--(6, 0) node[midway, below]{$40km/h$};
| lend[scope]
| draw[dot[only marks, mark=x, mark options = {draw=red}] file {gps.table};
```

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}
  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
     \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

```
1.5 ·10<sup>4</sup>

1.5 ·10<sup>4</sup>

1.5 ·10<sup>4</sup>

1.5 ·10<sup>4</sup>

1.5 ·10<sup>4</sup>

1.5 ·10<sup>4</sup>

Headway (min.)
```

```
\begin{tikzpicture}{
    blue,
    declare function = {
        cost(\x) = \T * \r / \x;
        waiting(\x) = \T * \x * \f / 2;
}

\def \T{60}
\def \T{60}
\def \T{60}
\def \T{200}
\def \W{1/3}
\begin{tikzpicture}
    vlabel={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,

\delta \delta
```

Figure 22: plot-22.tex: Parametrized plot