

FIGURE 2.1

Linear fit to the Olympics men's 100 m data with errors highlighted.

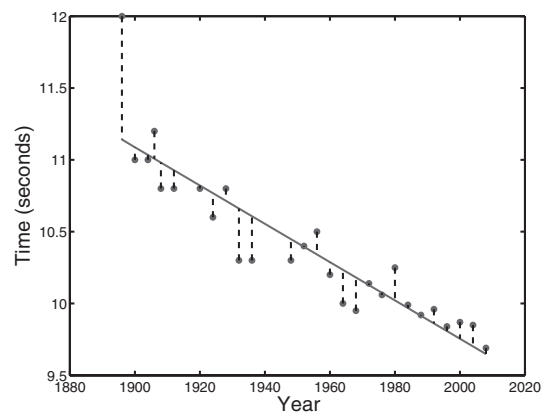


FIGURE 2.2

Dataset generated from a linear model.

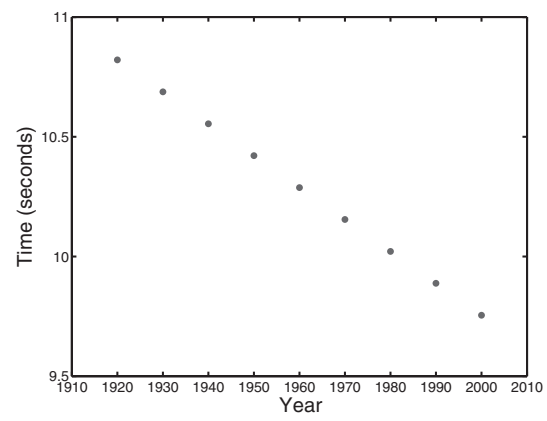


FIGURE 2.3

An example of the probability distribution function for a binomial random variable when $N = 50$ and $q = 0.7$ (see Equation 2.18).

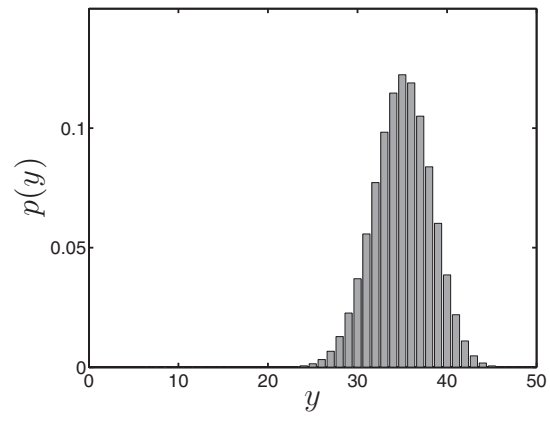


FIGURE 2.4

An example of the uniform pdf.

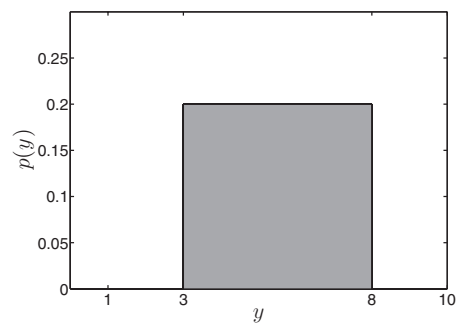


FIGURE 2.5

Effect of increasing the number of samples on the approximation to the expectation given in Equation 2.25 where $p(y)=\mathcal{U}(0,1)$. The dashed line is the true value of $1/3$. Note the log scale on the x -axis.

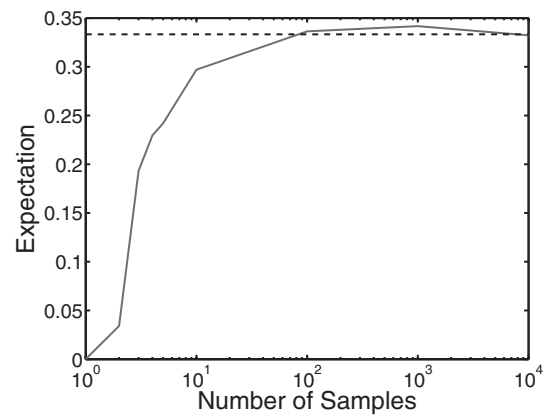


FIGURE 2.6

Examples of beta pdfs with three different pairs of parameters.

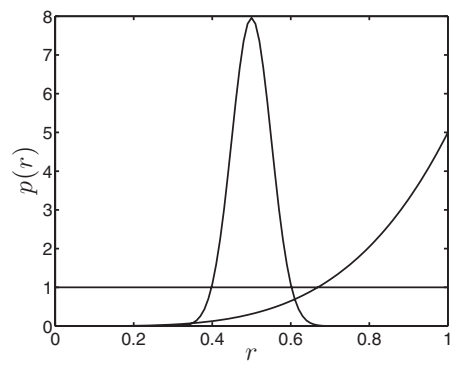


FIGURE 2.7

Three Gaussian pdfs with different means and variances.

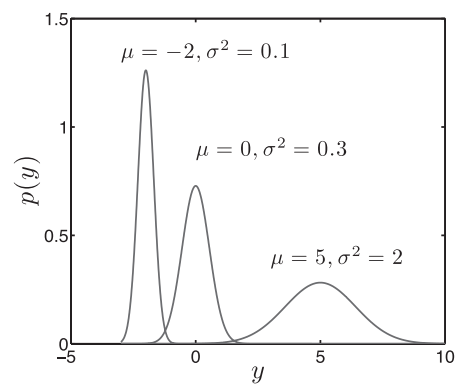


FIGURE 2.8

Example surface (left) and contour (right) plots for two different two-dimensional Gaussian pdfs.

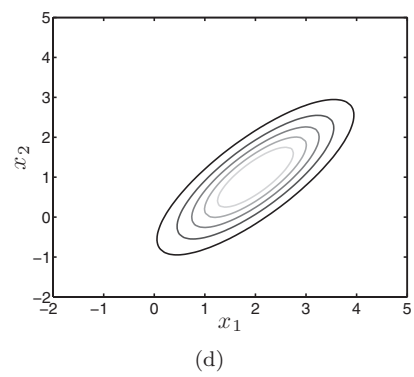
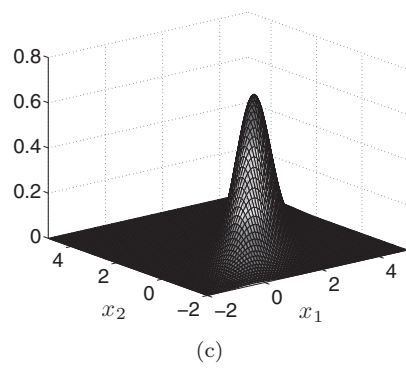
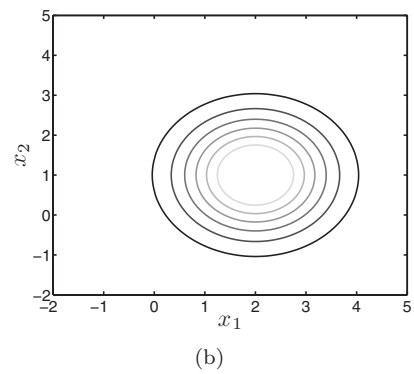
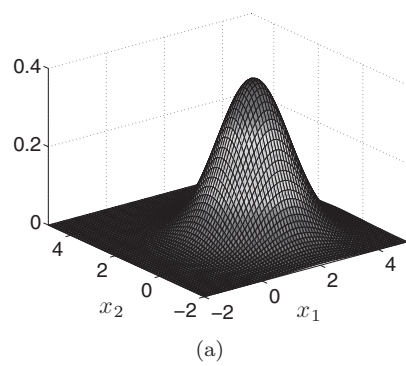


FIGURE 2.9

Dataset generated from a linear model with Gaussian errors.

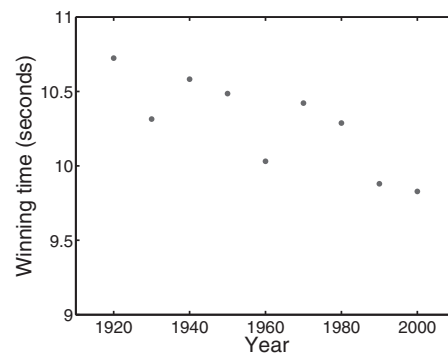


FIGURE 2.10

Likelihood function for the year 1980.

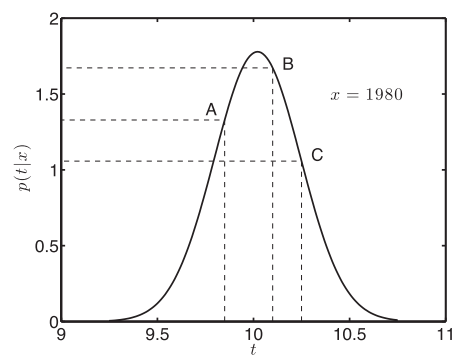
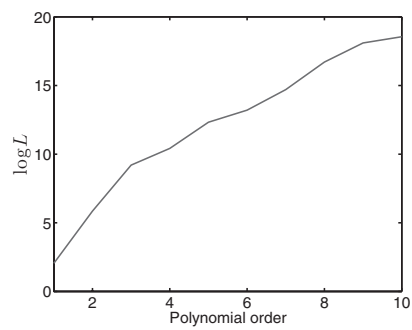
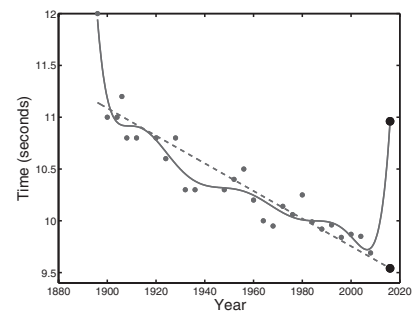


FIGURE 2.11

Model complexity example with Olympics men's 100m data.



(a) Increase in log likelihood as the polynomial order increases



(b) 1st and 8th order polynomial functions fitted to the Olympics men's 100 m data. Large dark circles correspond to predictions for the 2016 Olympics

FIGURE 2.12

Data generated from the model given in Equation 2.39 and the true function.

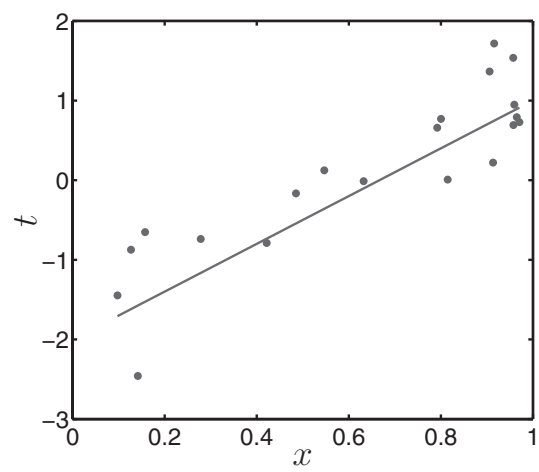


FIGURE 2.13

Variability in $\widehat{\mathbf{w}}$ for 10,000 datasets generated from the model described in Equation 2.39.

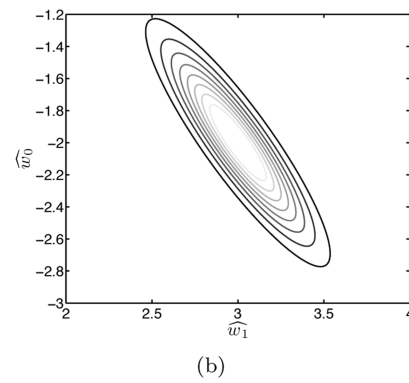
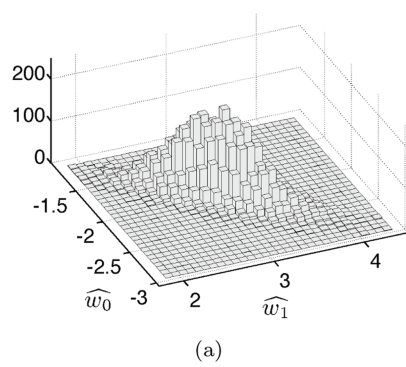


FIGURE 2.14

Functions inferred from 10 datasets generated from the model given in Equation 2.39 as well as the true function (wider, darker line).

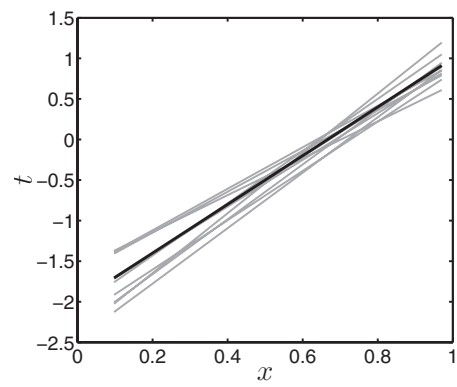


FIGURE 2.15

Two example datasets with different noise levels and the corresponding likelihood function.

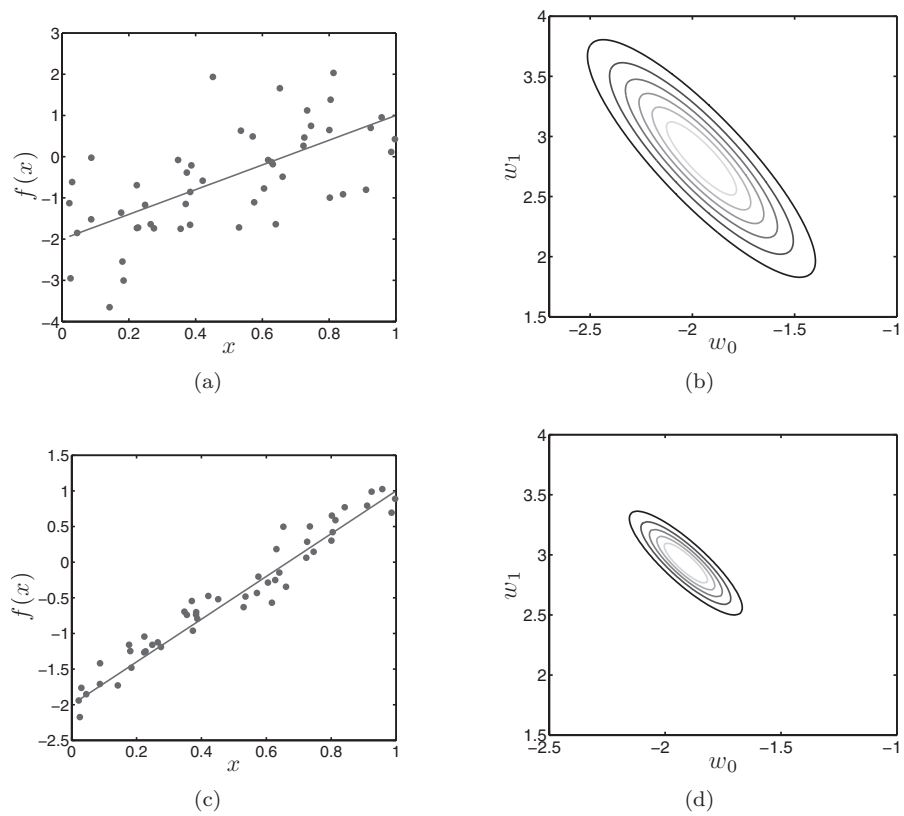


FIGURE 2.16

Ten samples of \mathbf{w} using the distribution given in Equation 2.48.

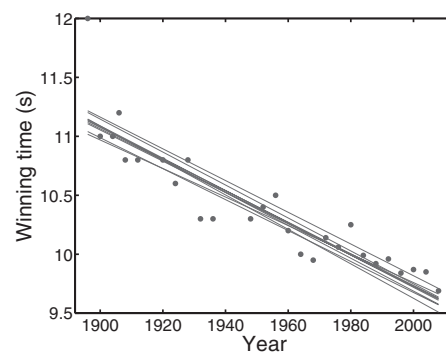
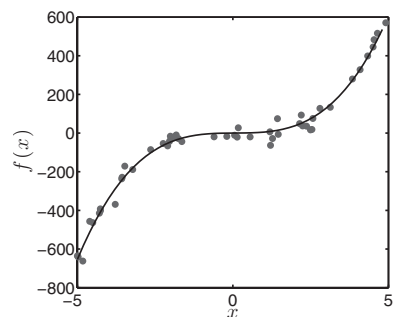
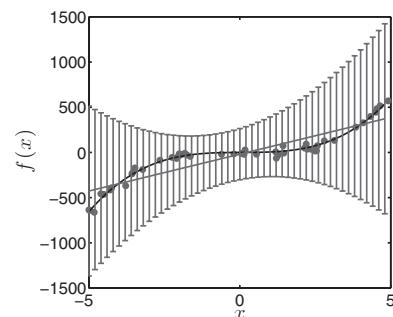


FIGURE 2.17

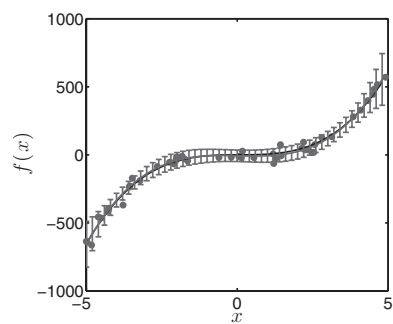
(a) Example data set. (b), (c) and (d) Predictive error bars for a linear, cubic and 6th order model, respectively.



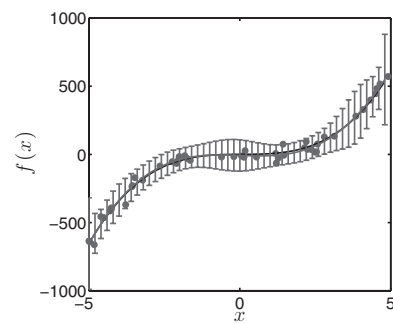
(a)



(b)



(c)



(d)

FIGURE 2.18

Examples of functions with parameters drawn from a Gaussian with mean $\hat{\mathbf{w}}$ and covariance $\text{cov}\{\hat{\mathbf{w}}\}$ for the example data set shown in Figure 2.17(a).

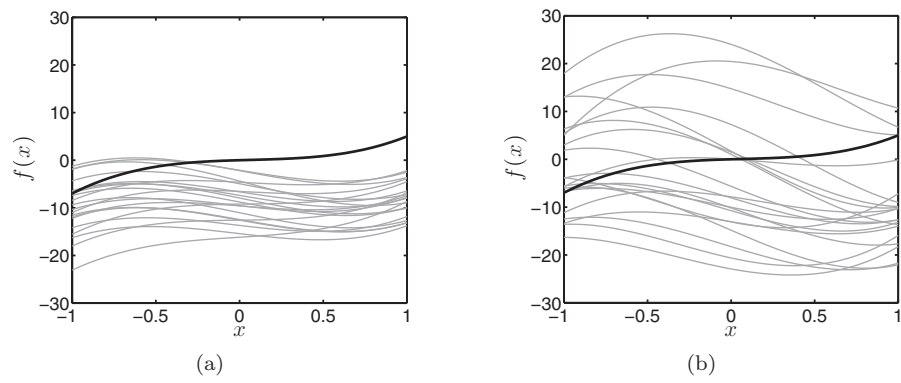


FIGURE 2.19

Evolution of the theoretical and empirical estimates of $E_{p(\mathbf{t}|\mathbf{X},\mathbf{W},\sigma^2)}\{\widehat{\sigma^2}\}$ as the number of data points increases.

