Numerical Analysis

EIGHTH EDITION

Richard L. Burden
Youngstown State University

J. Douglas Faires
Youngstown State University

CHAPTER

2

Solutions of Equations in One Variable

Figure 2.1

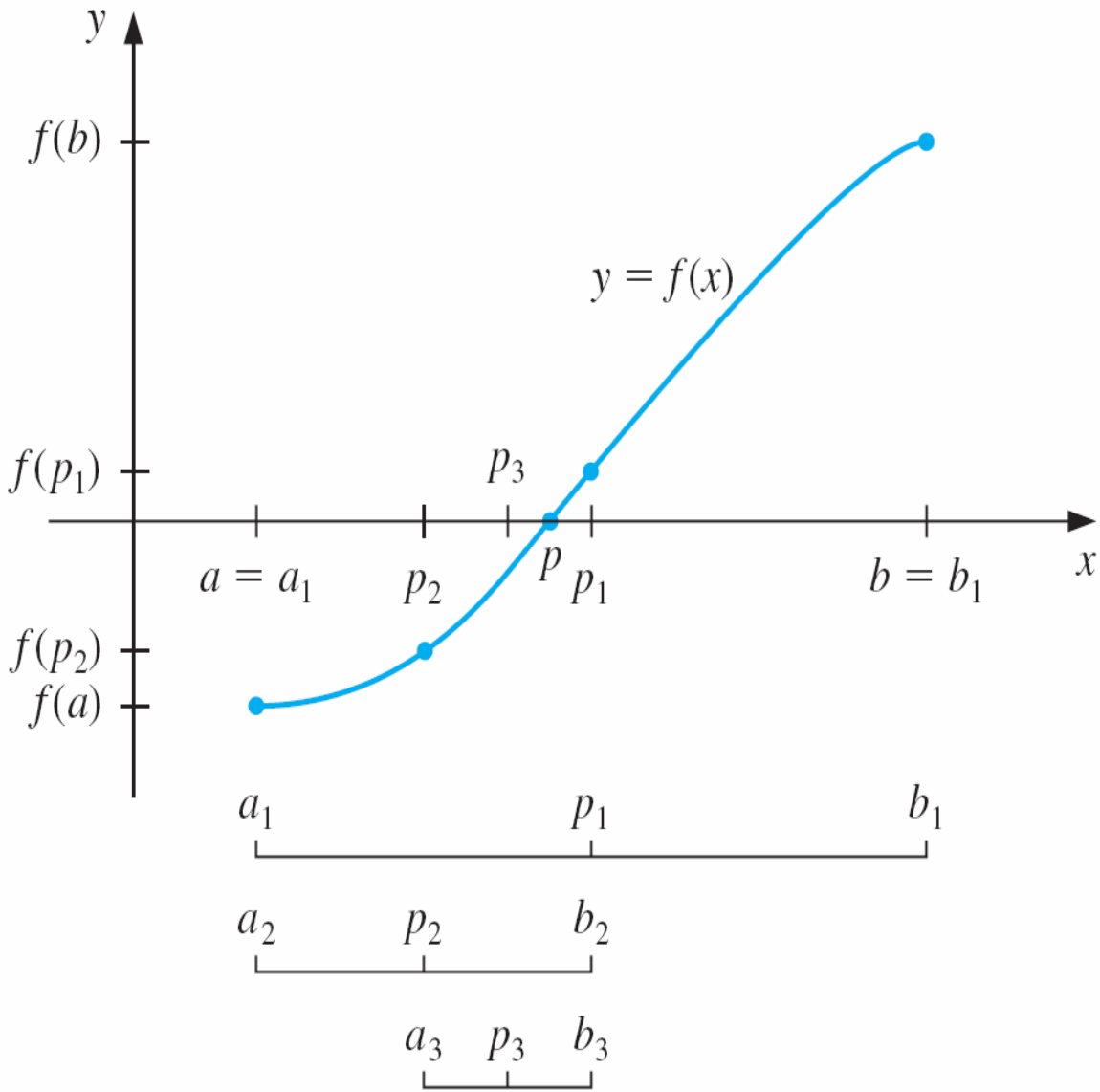


Figure 2.2

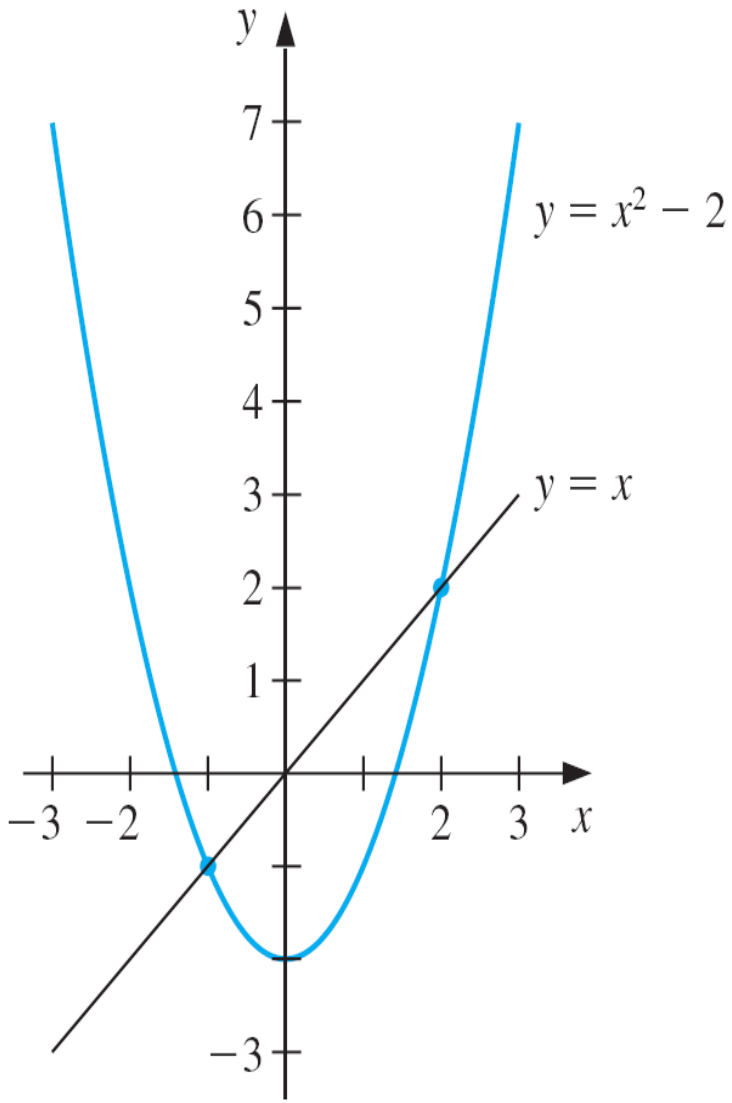


Figure 2.3

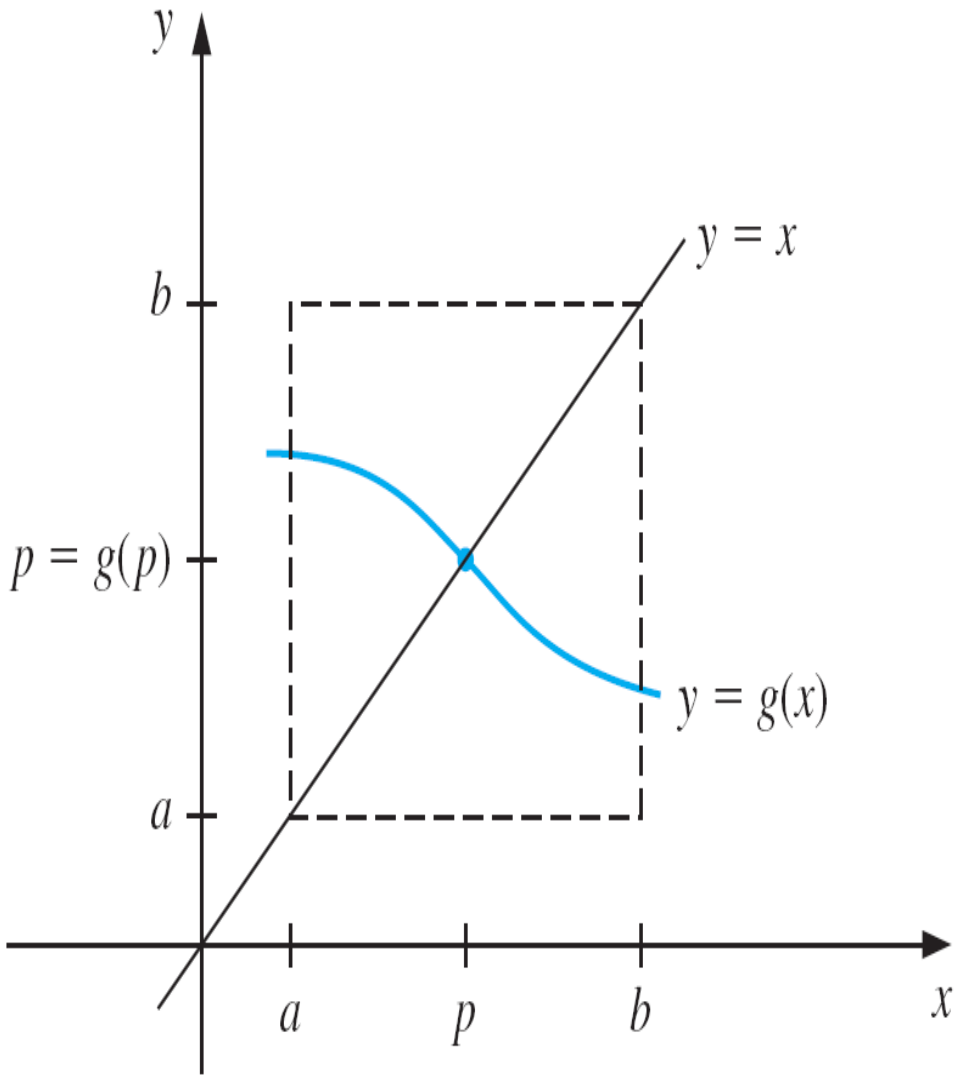


Figure 2.4

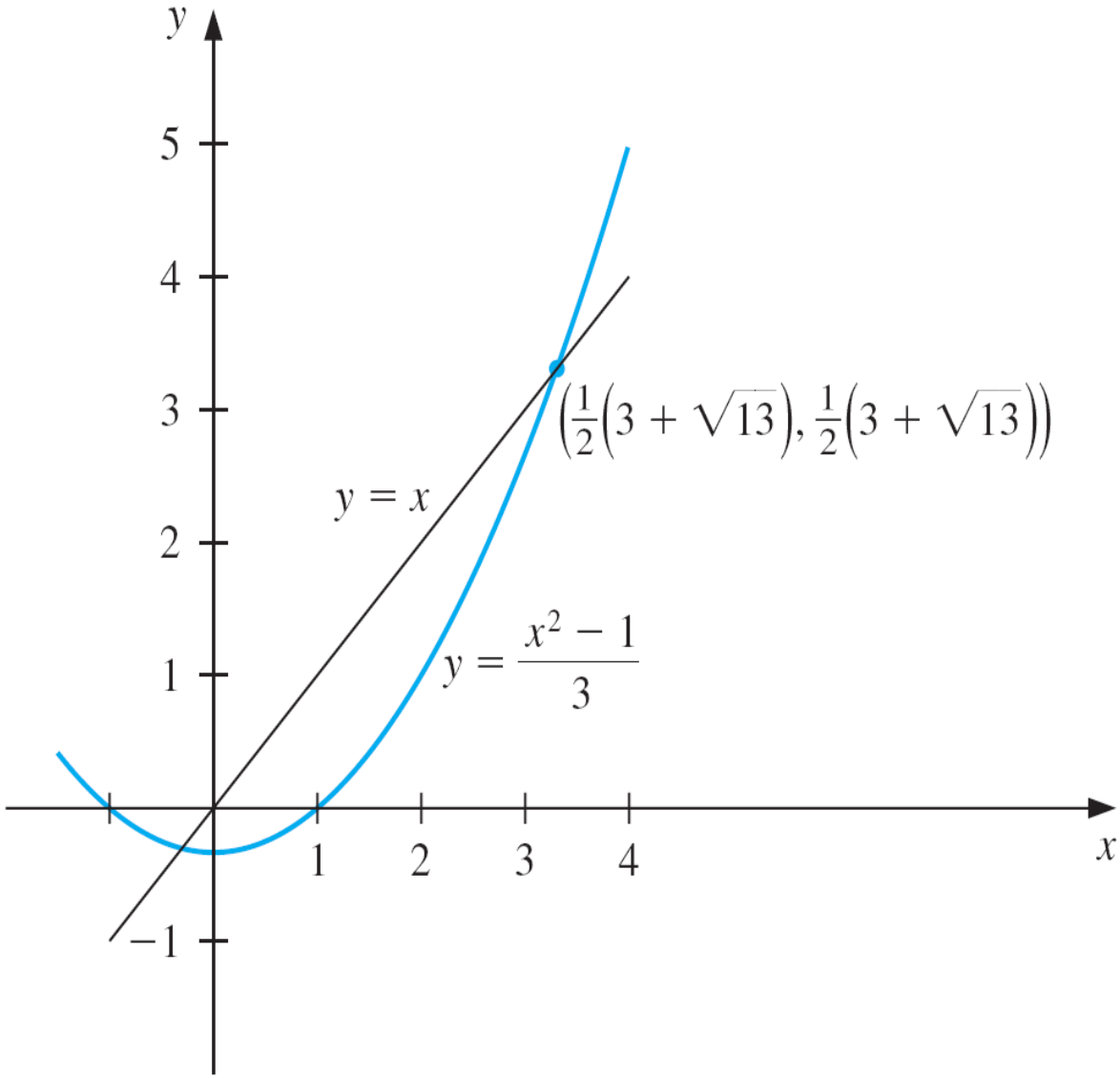

y
5
4
3
2
1
−1
1
2
3
4
x
$\left(\frac{1}{2}\left(3+\sqrt{13}\right), \frac{1}{2}\left(3+\sqrt{13}\right)\right)$
$y = x$
$y = \frac{x^2 - 1}{3}$

Figure 2.5

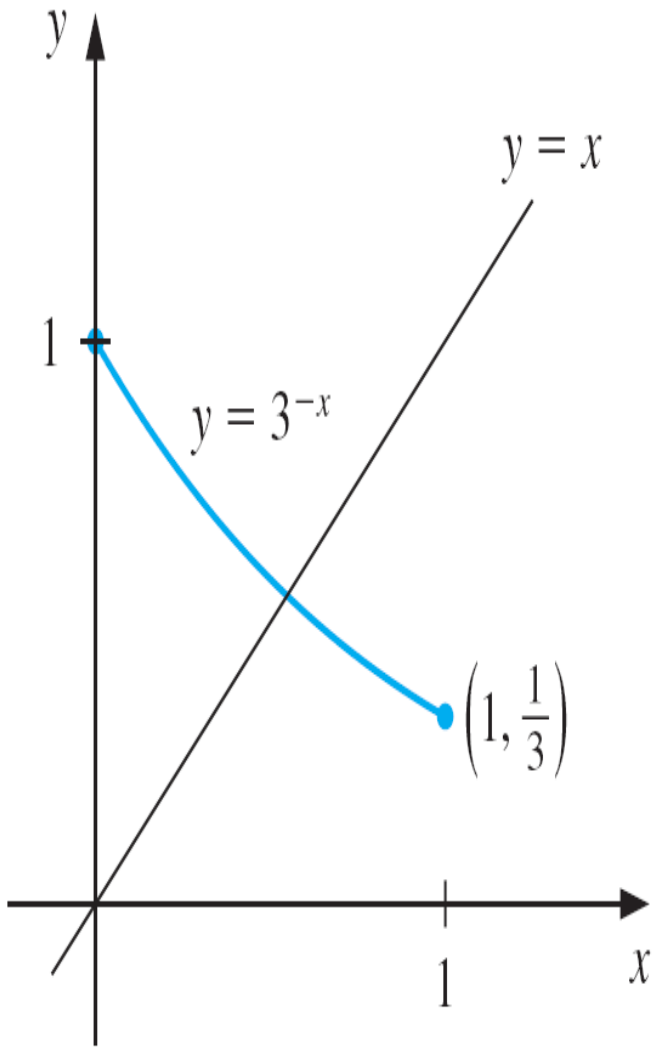


Figure 2.6

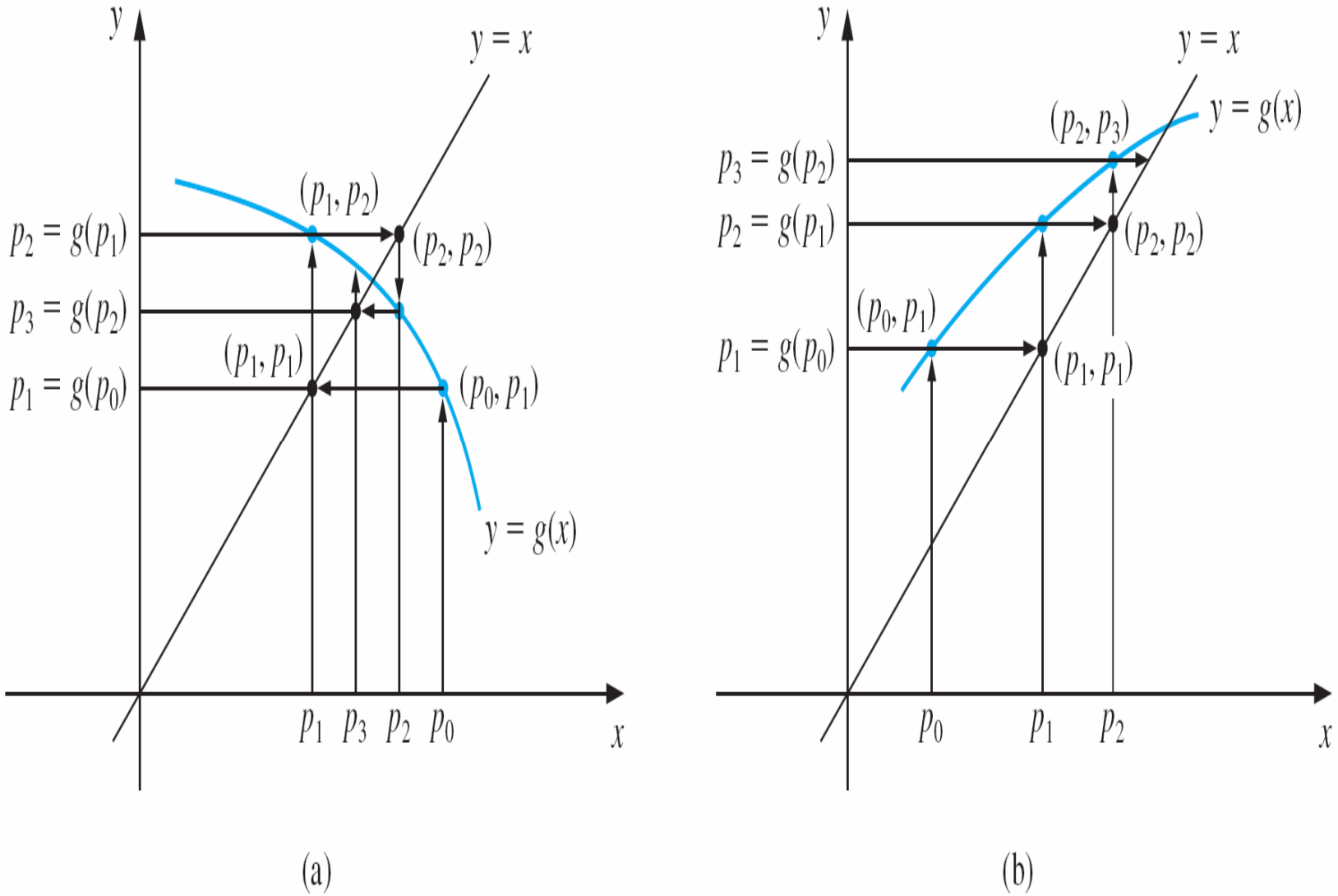

y
y = x
(p1, p2)
p2 = g(p1)
(p2, p2)
p3 = g(p2)
(p1, p1)
p1 = g(p0)
(p0, p1)
y = g(x)
p1 p3 p2 p0
x
(a)
y
y = x
y = g(x)
(p2, p3)
p3 = g(p2)
p2 = g(p1)
(p2, p2)
(p0, p1)
p1 = g(p0)
(p1, p1)
p0 p1 p2
x
(b)

Figure 2.7

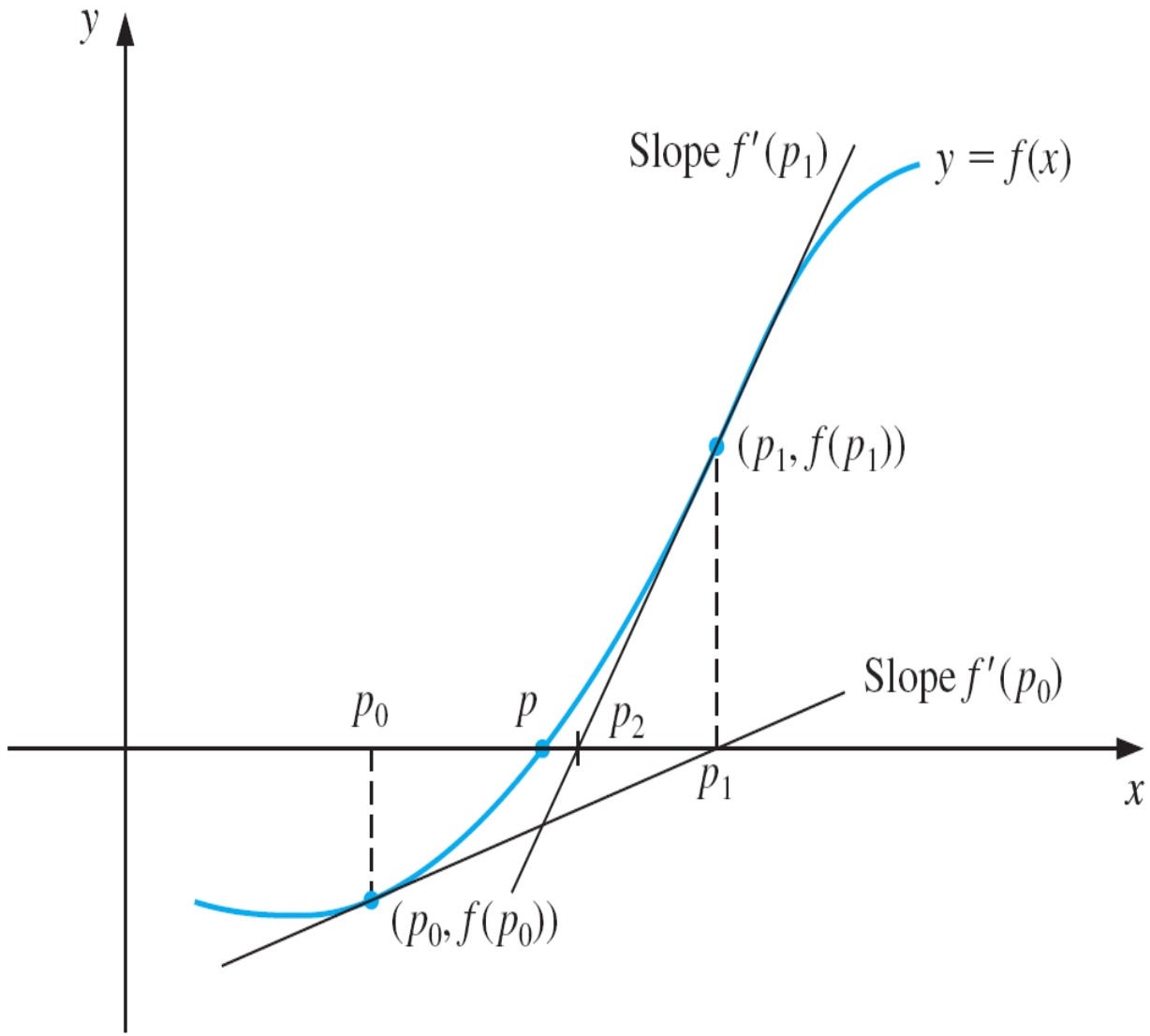
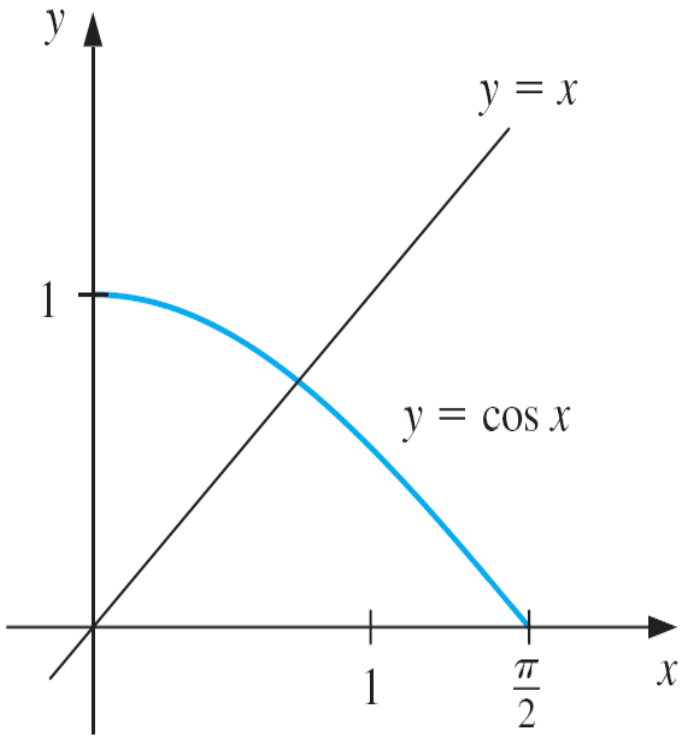


Figure 2.8



With $p_0 = \pi/4$, the approximations in Table 2.4 are generated. An excellent approximation is obtained with $n = 3$. We would expect this result to be accurate to the places listed because of the agreement of p_3 and p_4.

Figure 2.9

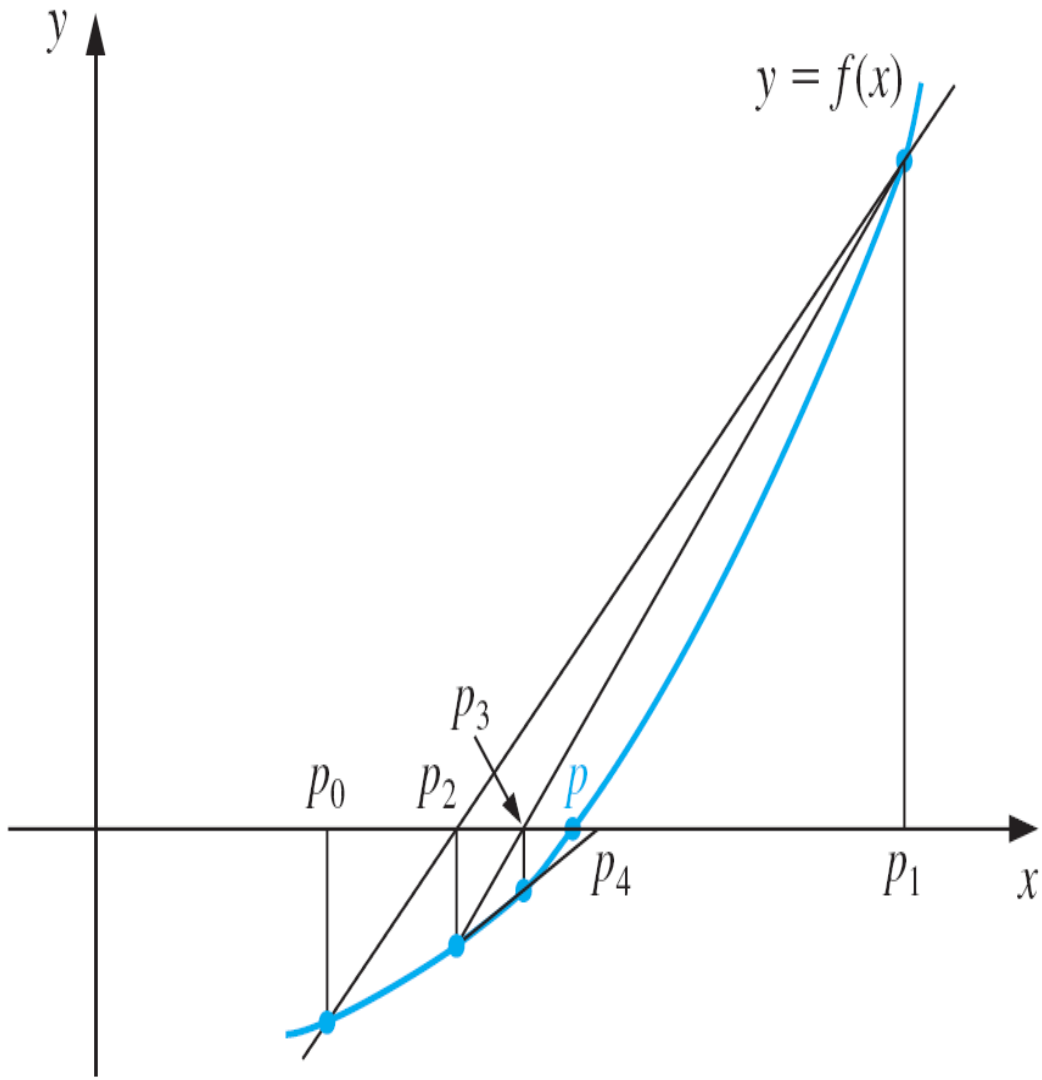


Figure 2.10

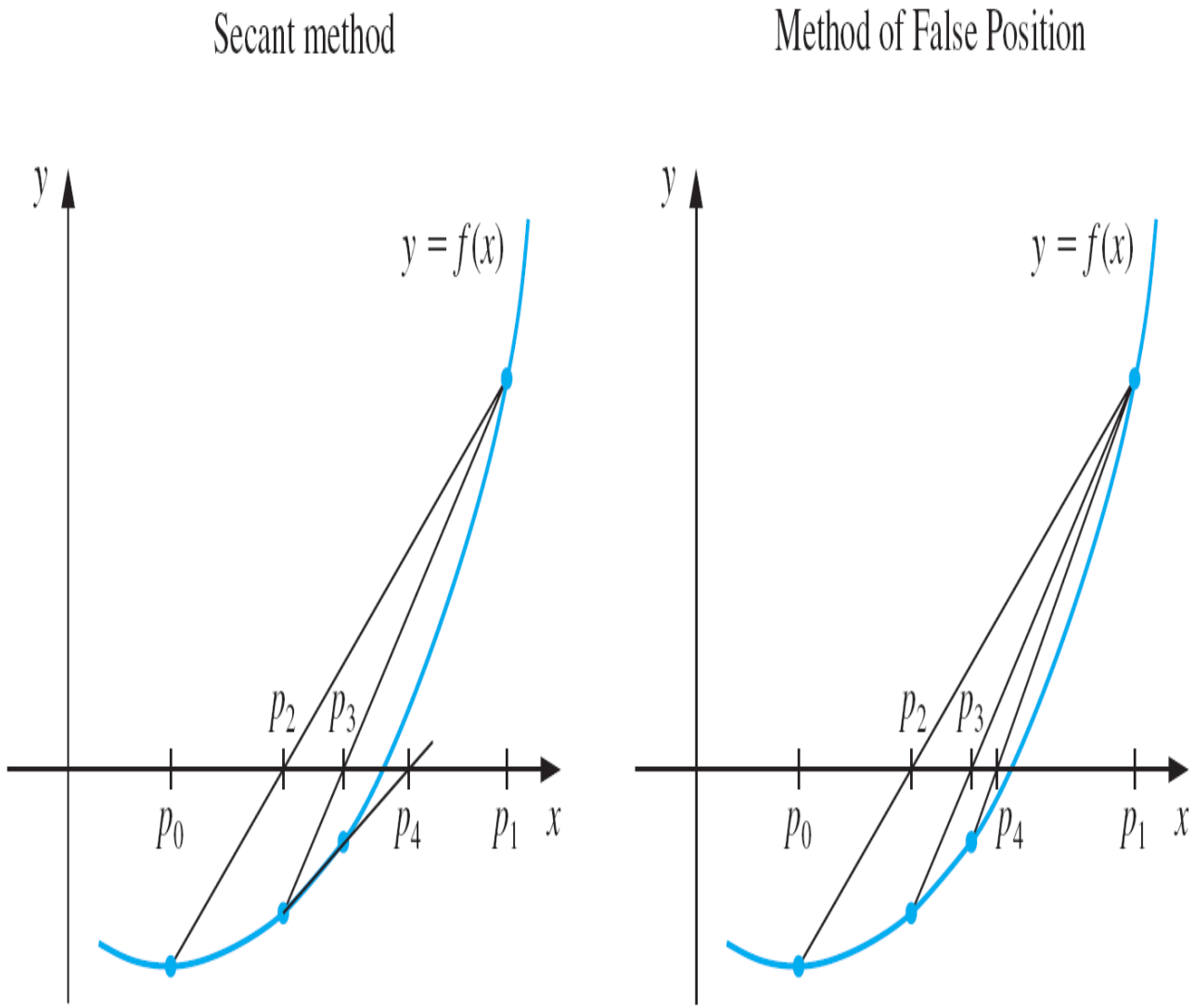


Figure 2.11

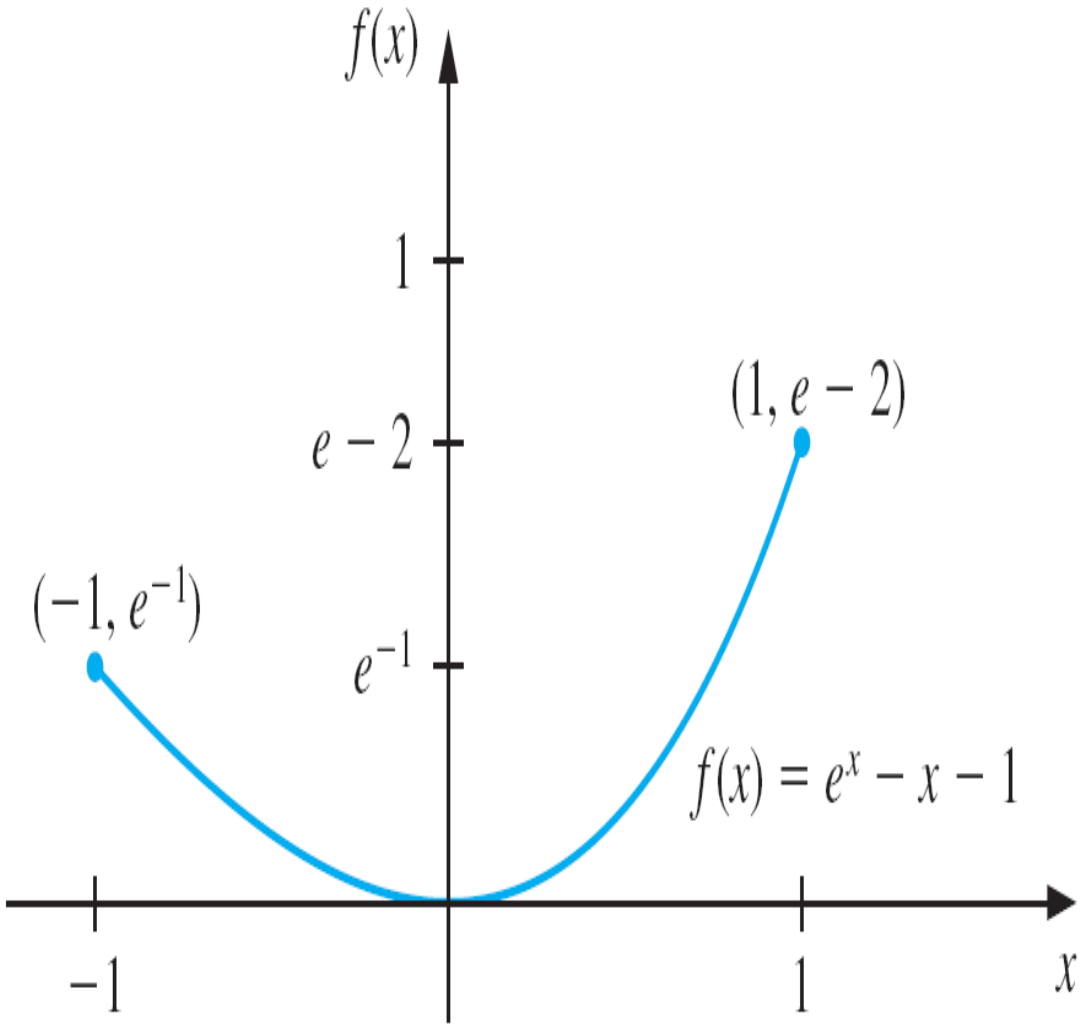


Figure 2.12