Chapter 6 Figures 51 To The End From

MATHEMATICAL METHODS for Scientists and Engineers

Donald A. McQuarrie

For the Novice Acrobat User or the Forgetful

When you opened this file you should have seen a slightly modified cover of the book *Mathematical Methods for Scientists and Engineers* by Donald A. McQuarrie, a menu bar at the top, some index markers at the left hand margin, and a scroll bar at the right margin.

Select the **View** menu item in the top menu and be sure **Fit in Window** and **Single Page** are selected. Select the **Window** menu item and be sure **Bookmarks** and **Thumbnails** ARE NOT selected.

You can and probably should make the top menu bar disappear by pressing the function key F9. Pressing this key (F9) again just toggles the menu bar back on. You may see another tool bar that is controlled by function key F8. Press function key F8 until the tool bar disappears.

In the upper right hand corner margin of the window containing this text you should see a few small boxes. DO NOT move your mouse to the box on the extreme right and click in it; your window will disappear! Move your mouse to the second box from the right and click (or left click); the window containing this text should enlarge to fill the screen. Clicking again in this box will shrink the window; clicking again will return the display to full screen.

The prefered means of navigation to any desired figure is controlled by the scroll bar in the column at the extreme right of the screen image. Move your mouse over the scroll bar slider, click, and hold the mouse button down. A small window will appear with the text "README (2 of 12)". Continuing to hold down the mouse button and dragging the button down will change the text in the small window to something like "6.54 (6 of 12)". Releasing the mouse button at this point moves you to Figure 6.54 of Chapter 6. The (6 of 12) indicates that Figure 6.54 resides on page 6 of the 12 pages of this document.

ANIMATIONS

There are no animations in this chapter.

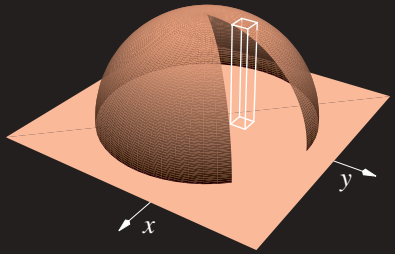


Figure 6.51
The integration scheme used in Example 3 to determine the volme of a hemisphere.

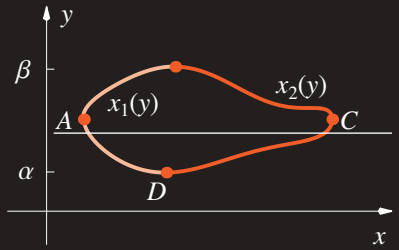


Figure 6.52
The region shown in Figure 6.48 where any line parallel to the x axis crosses the boundary of R at two points at the most.

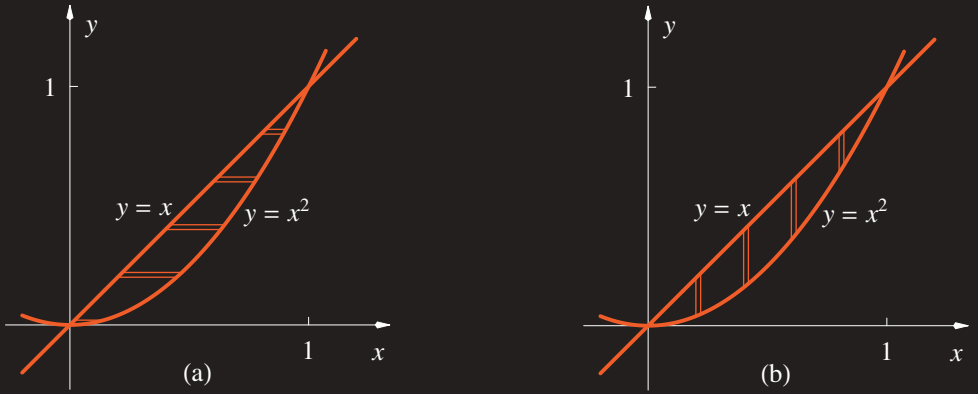
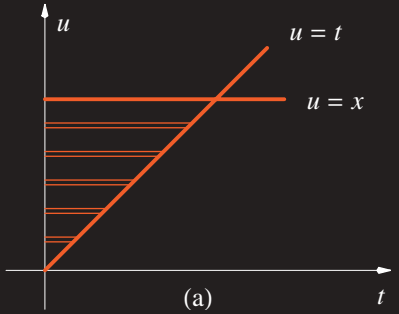


Figure 6.53
The region in the first quadrant bounded by the curves $y = x^2$ and $y = x$. (a) The integration is over x first (y to $y^{1/2}$) and then over y (0 to 1). (b) The integration is over y first (x^2 to x) and then over x (0 to 1).



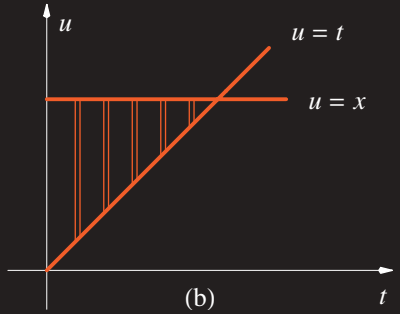
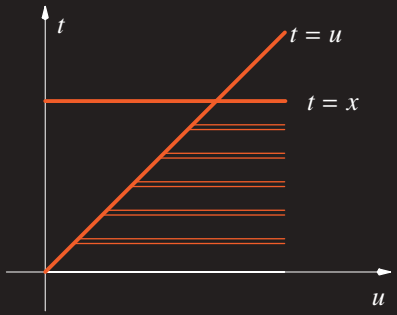


Figure 6.54
Pictorial aids to the evaluation of the integral in Equation 7 by reversing the orders of integration. In (a), we integrate over t first, and in (b), we integrate over u first.



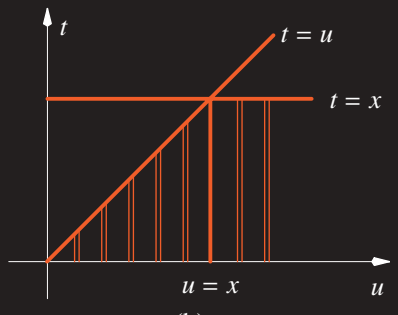


Figure 6.55
Pictorial aids to the evaluation of $\int_0^x dt\, E_1(t)$ in Example 4. In (a) we first integrate over u from t to ∞ (horizontal strips) and then over t from 0 to x (adding up the horizontal stripes). In (b), we first integrate over t from 0 to u if $u < x$ and from 0 to x if $u \geq x$ (vertical strips) and then we integrate over u from 0 to ∞.

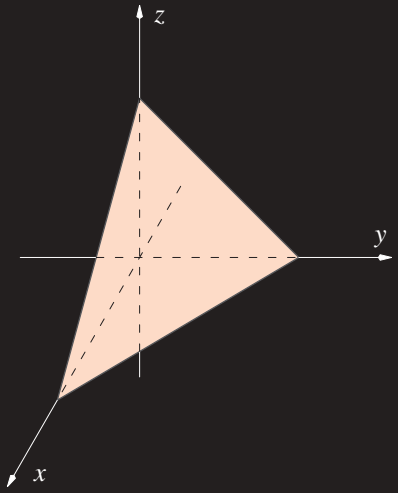


Figure 6.56
The region bounded by the plane $x + y + z = a$ and the three coordinate planes $x = 0$, $y = 0$, and $z = 0$.

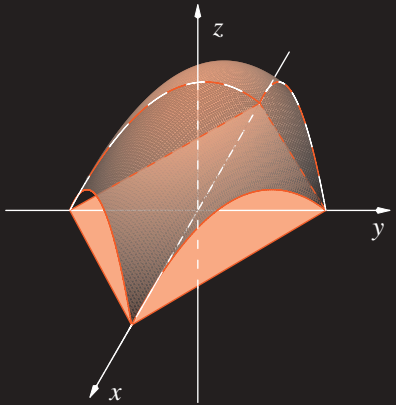


Figure 6.57
An illustration of the volume to be determined in Problem 6.

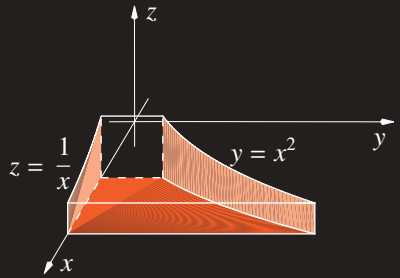


Figure 6.58
An illustration of the volume to be determined in Problem 7.

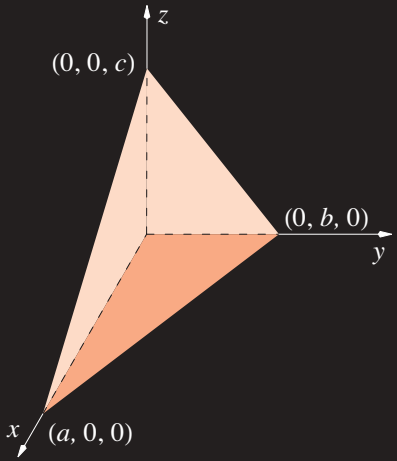
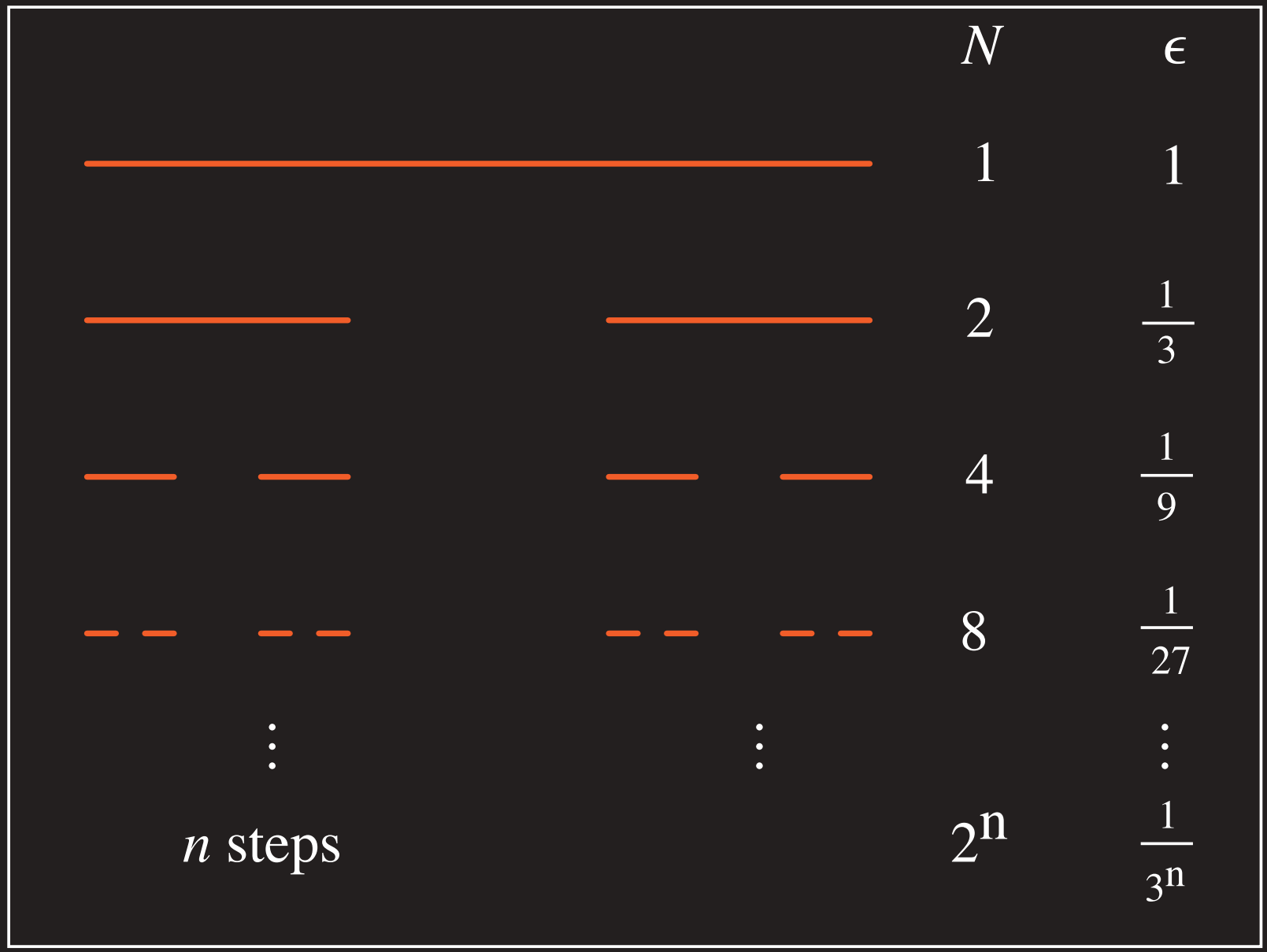


Figure 6.59
An illustration of the body whose center of mass is to be determined in Problem 9.



The Concept of Fractal Dimension