

Figure 10.37

- (a) The hyperboloid of one sheet  

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$
- (b) The hyperboloid of two sheets  

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = -1$$

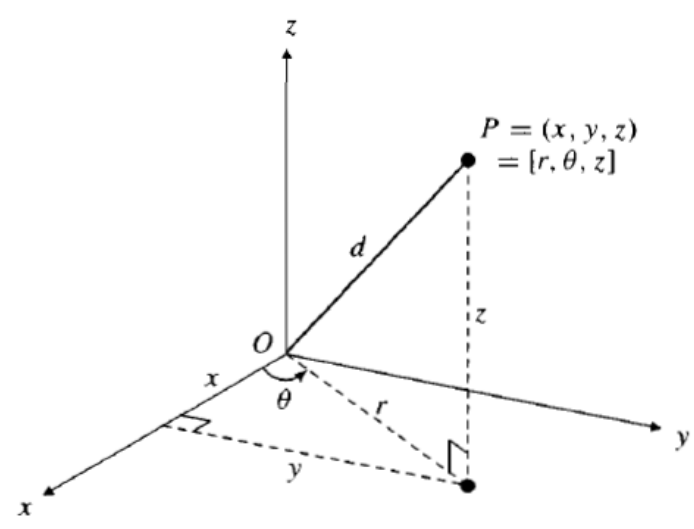
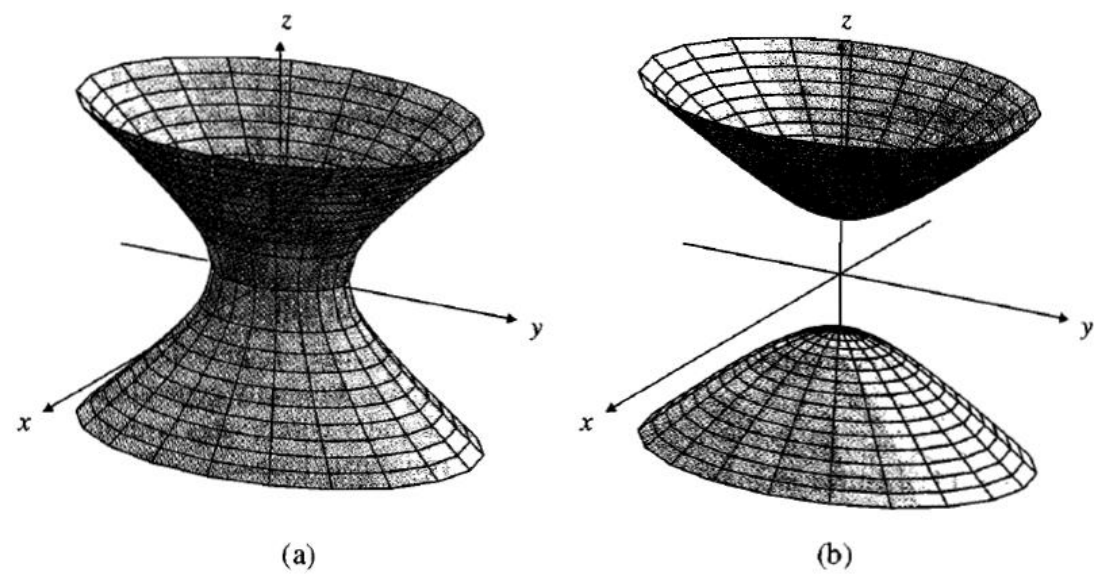


Figure 10.38 The cylindrical coordinates of a point

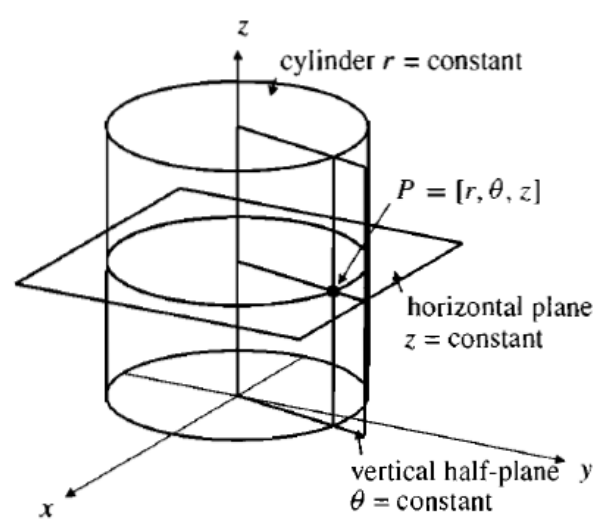


Figure 10.39 The coordinate surfaces for cylindrical coordinates

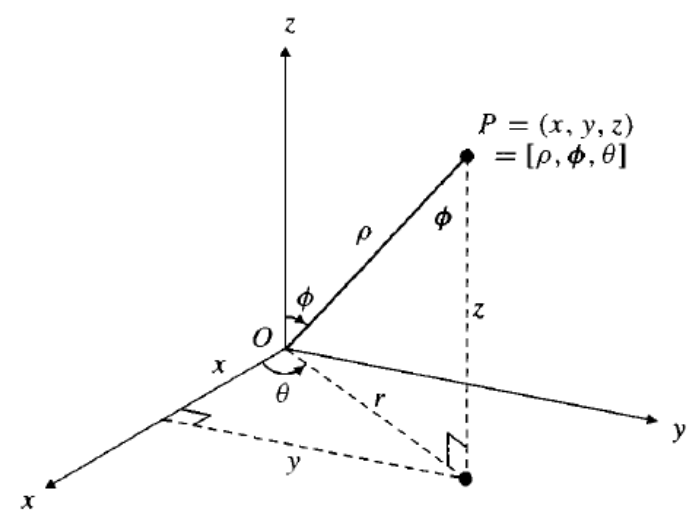


Figure 10.40 The spherical coordinates of a point

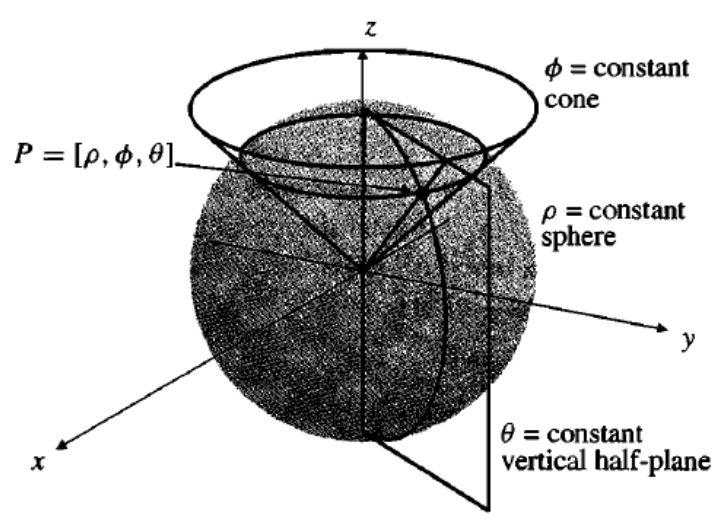


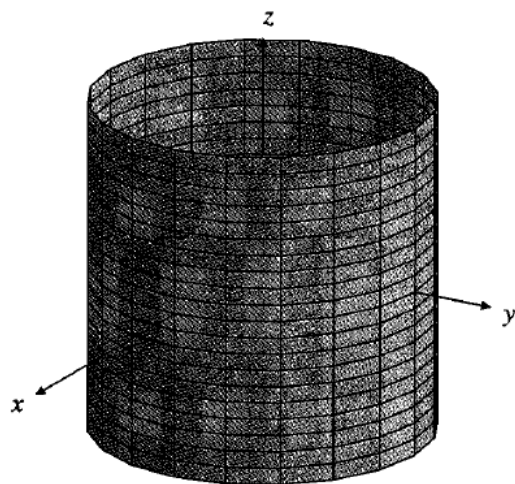
Figure 10.41 The coordinate surfaces for spherical coordinates

Figure 10.34

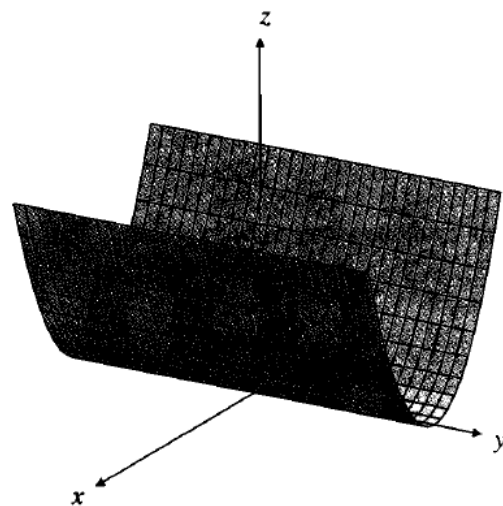
(a) The circular cylinder

$$x^2 + y^2 = a^2$$

(b) The parabolic cylinder  $z = x^2$



(a)

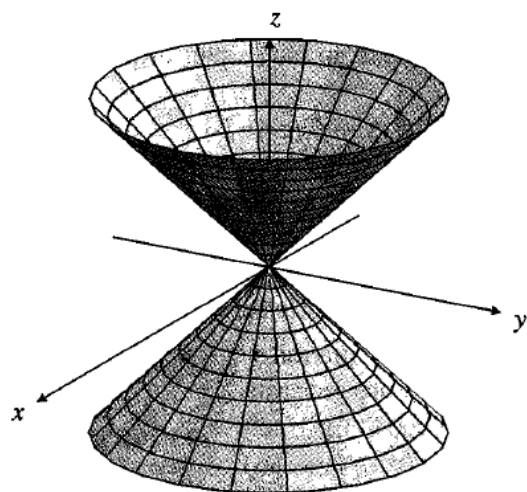


(b)

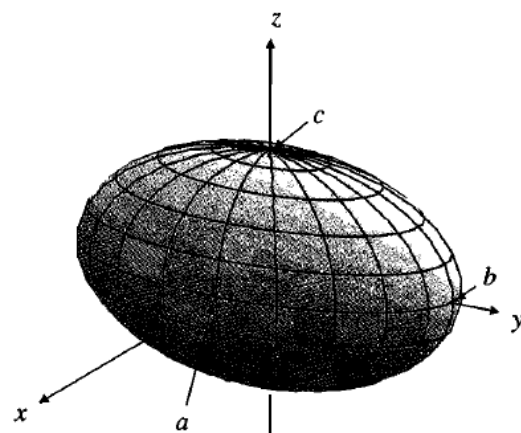
Figure 10.35

(a) The circular cone  $a^2 z^2 = x^2 + y^2$

(b) The ellipsoid  $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$



(a)



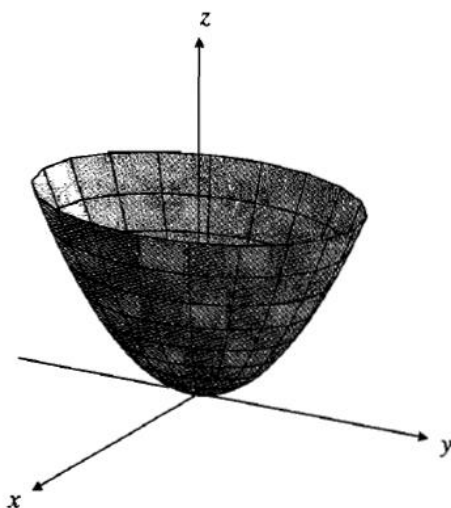
(b)

Figure 10.36

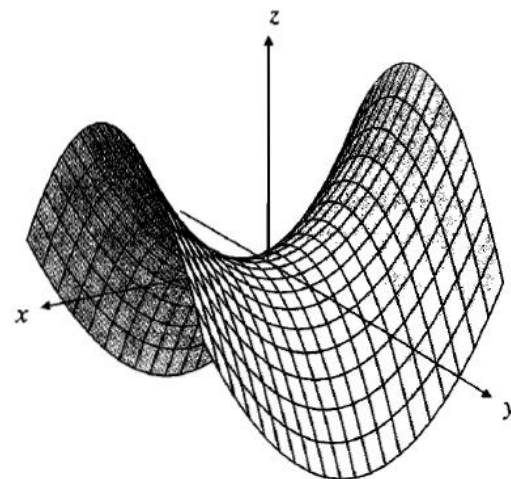
(a) The elliptic paraboloid  $z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$

(b) The hyperbolic paraboloid

$$z = \frac{x^2}{a^2} - \frac{y^2}{b^2}$$



(a)



(b)