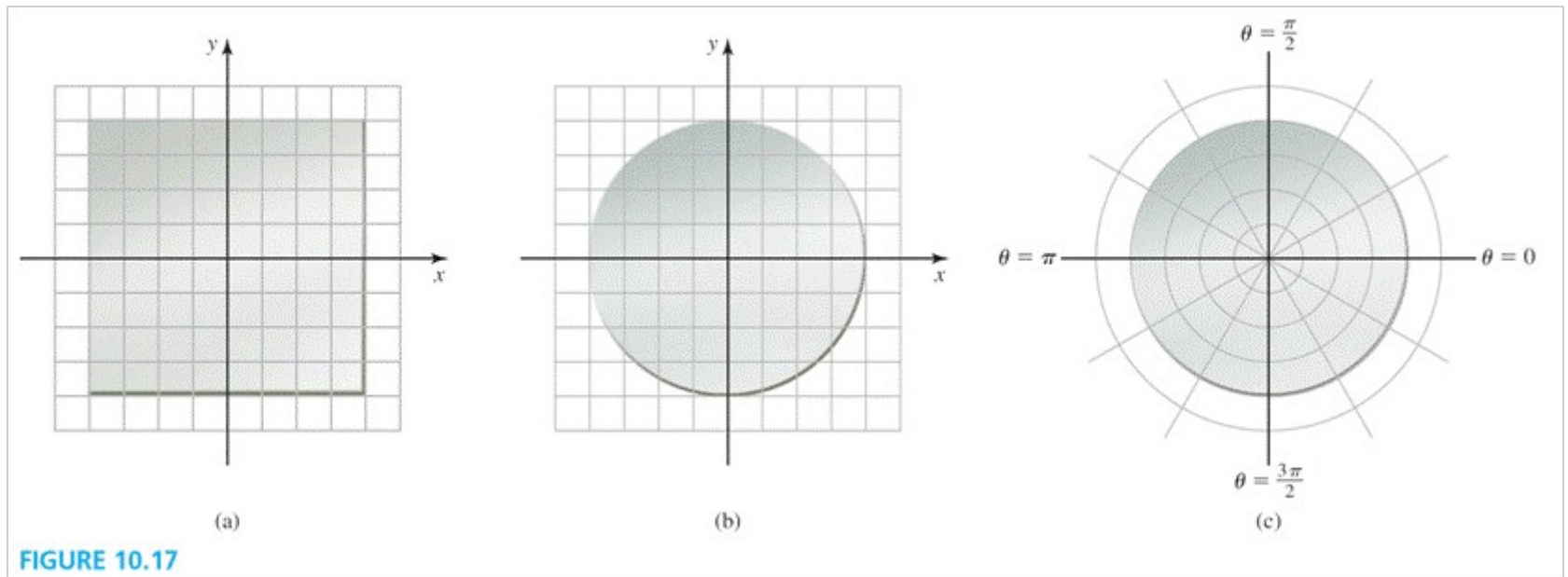


Chapter 10

Parametric and Polar Curves

10.2

Polar Coordinates



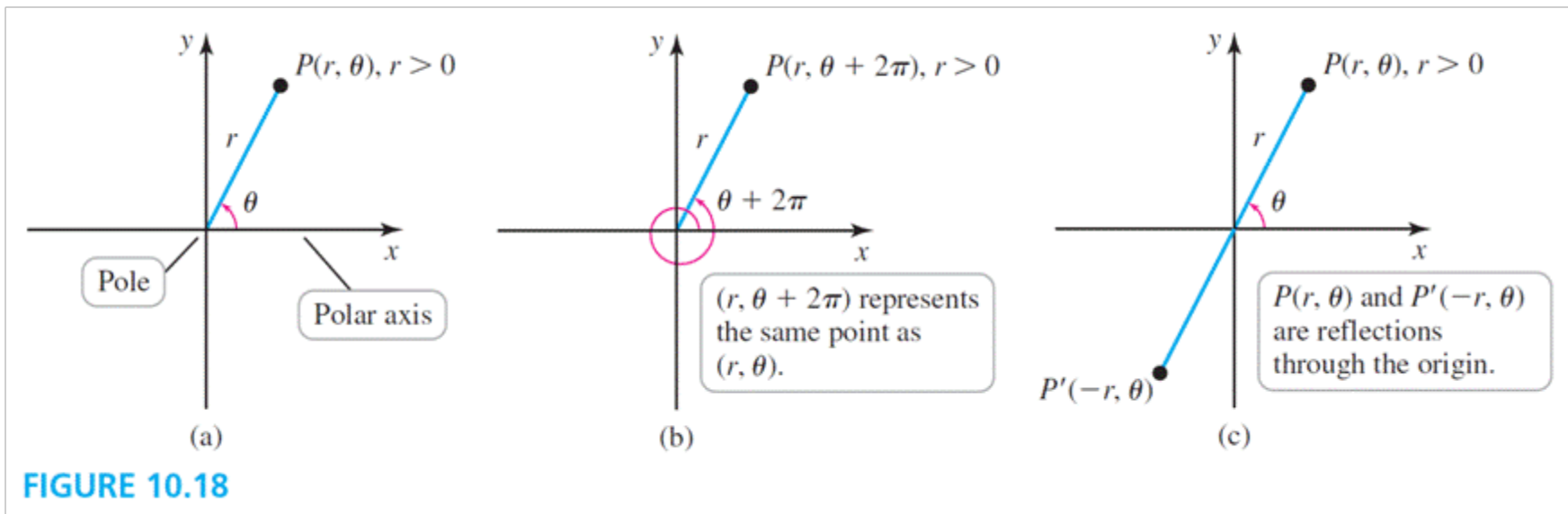
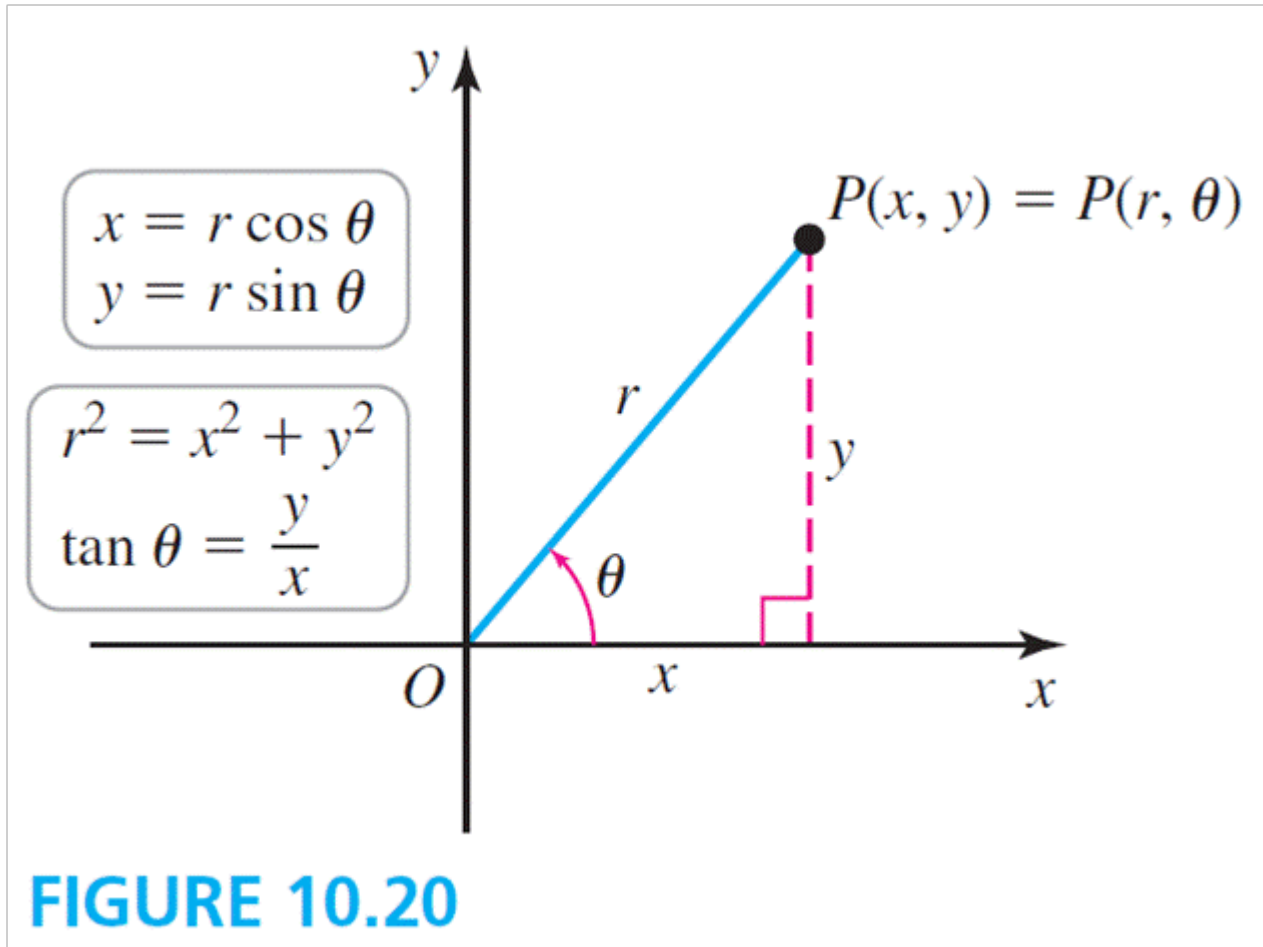
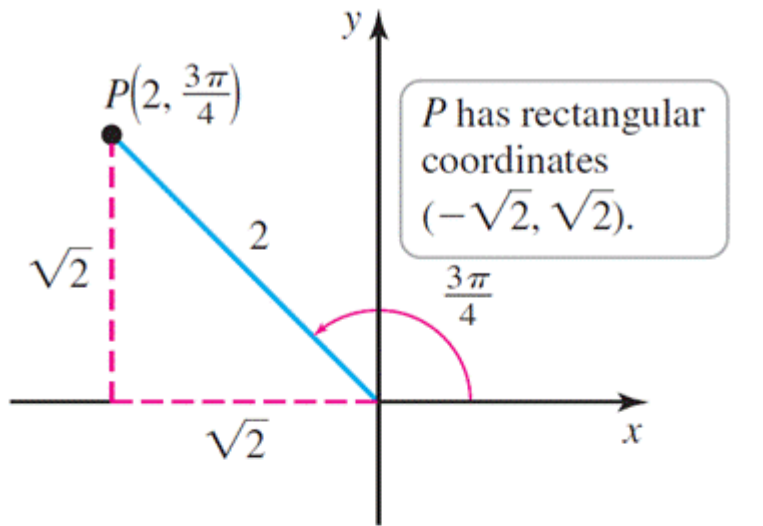
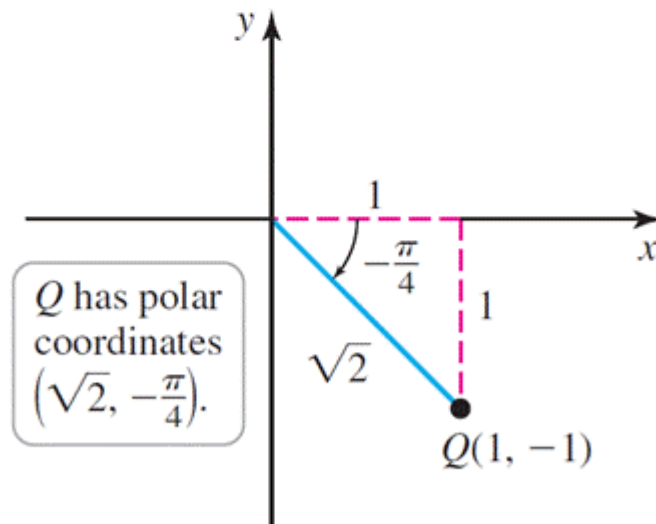


FIGURE 10.18





(a)



(b)

FIGURE 10.21

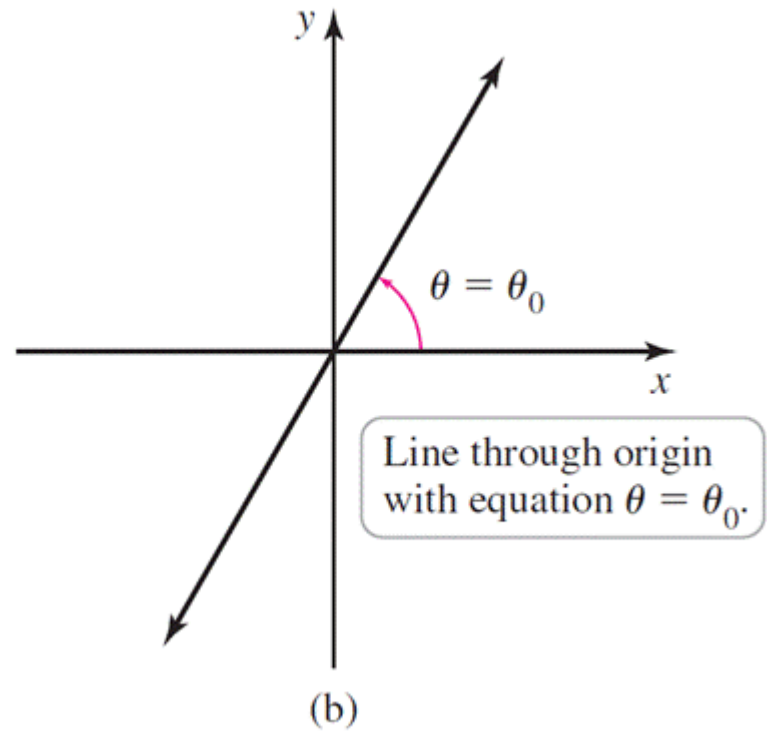
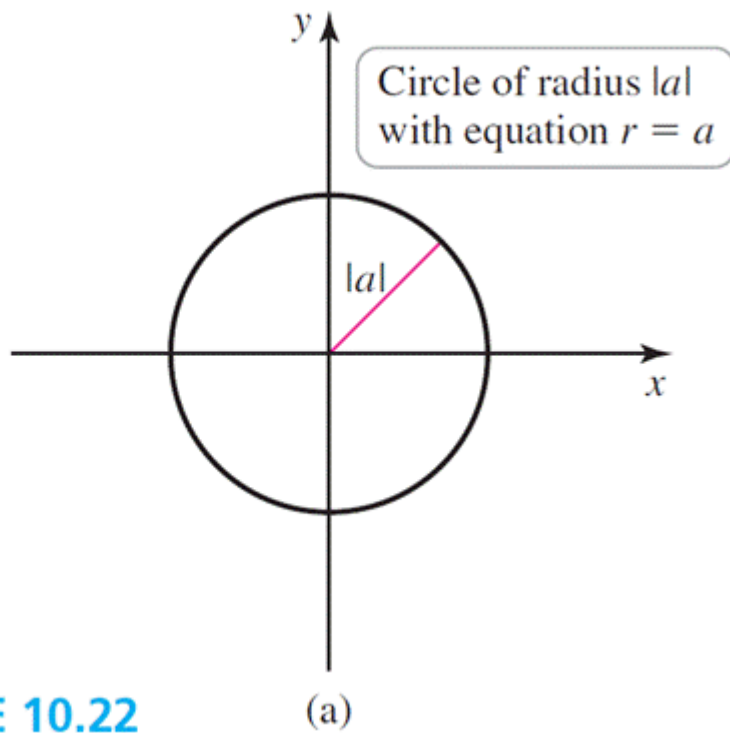
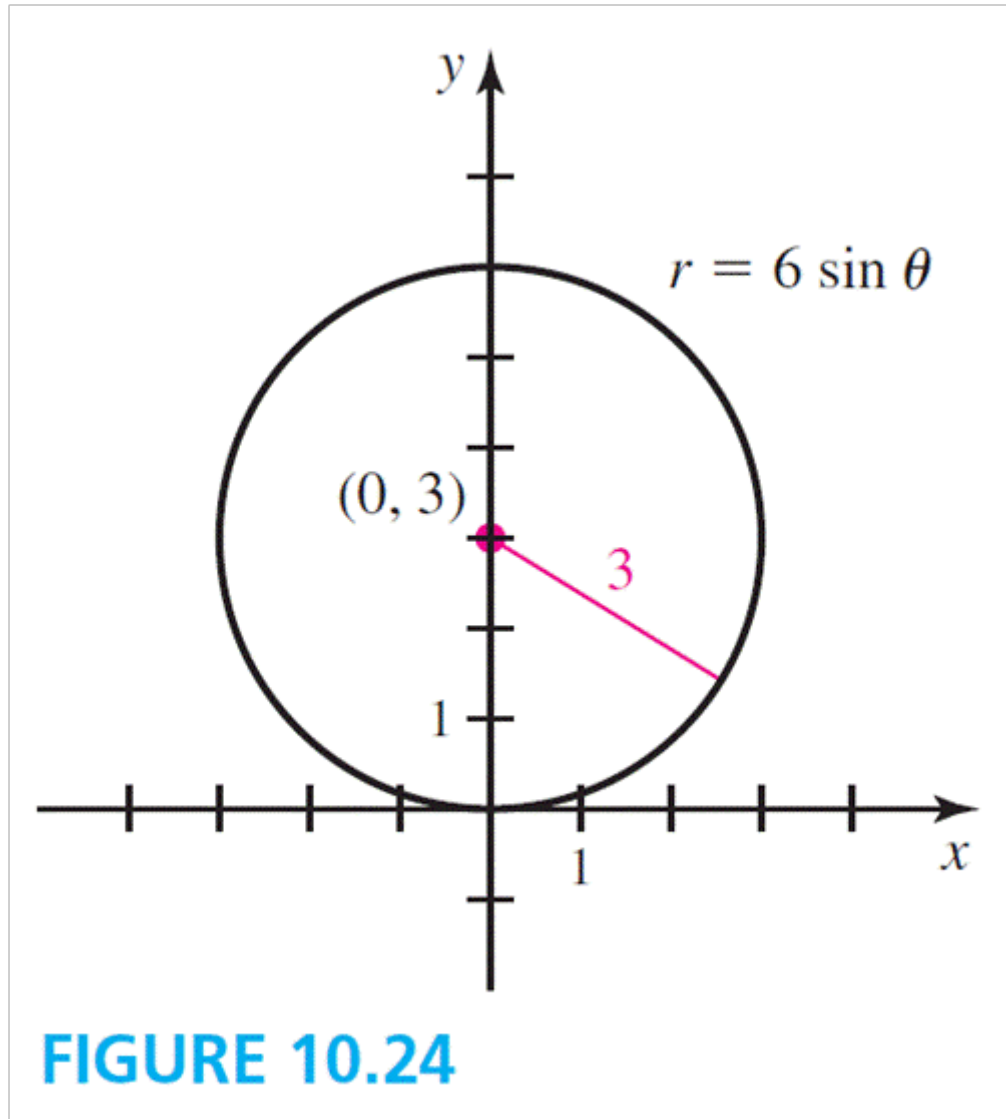


FIGURE 10.22



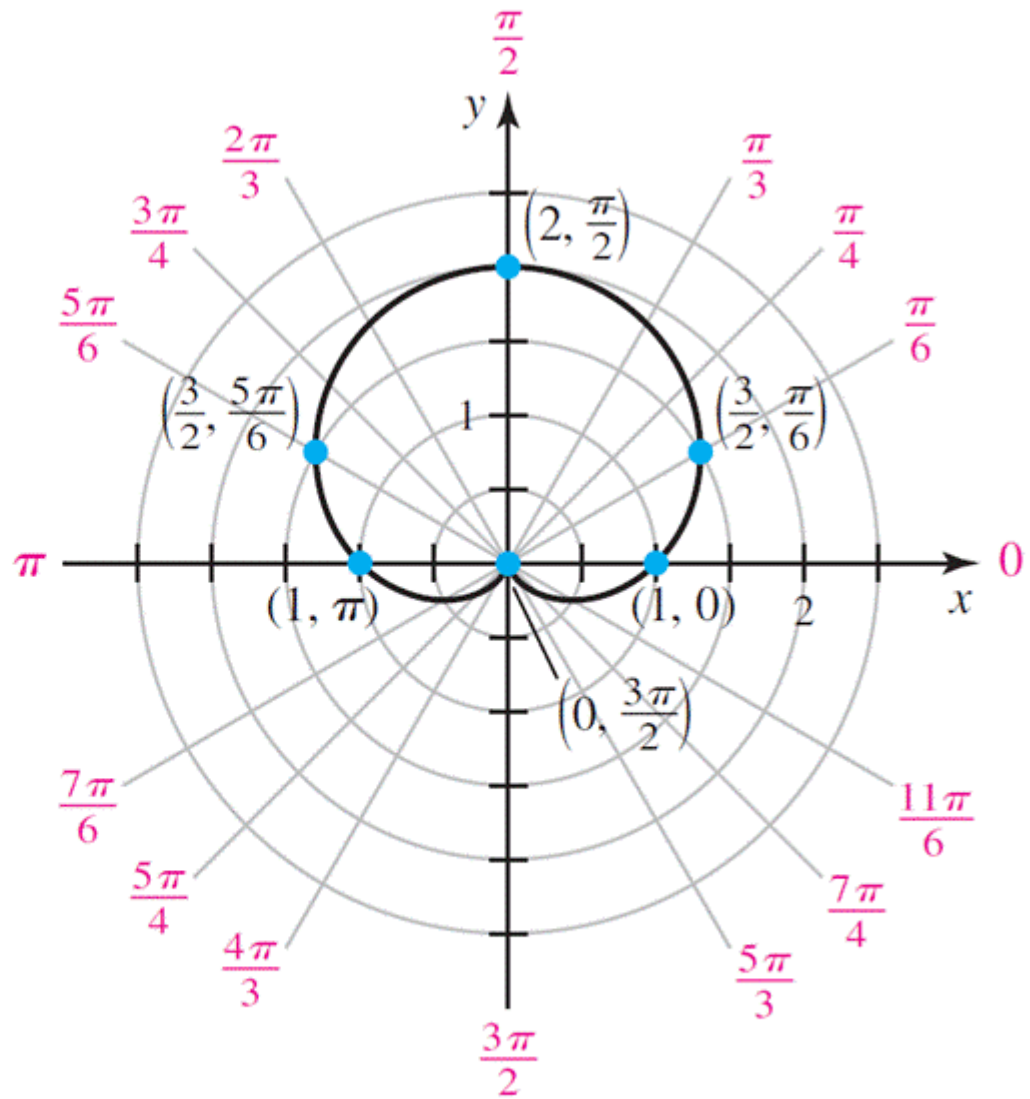


FIGURE 10.25

Cardioid $r = 1 + \sin \theta$

Table 10.3

θ	$r = 1 + \sin \theta$
0	1
$\pi/6$	$3/2$
$\pi/2$	2
$5\pi/6$	$3/2$
π	1
$7\pi/6$	$1/2$
$3\pi/2$	0
$11\pi/6$	$1/2$
2π	1

13.5

Triple Integrals in Cylindrical and Spherical Coordinates

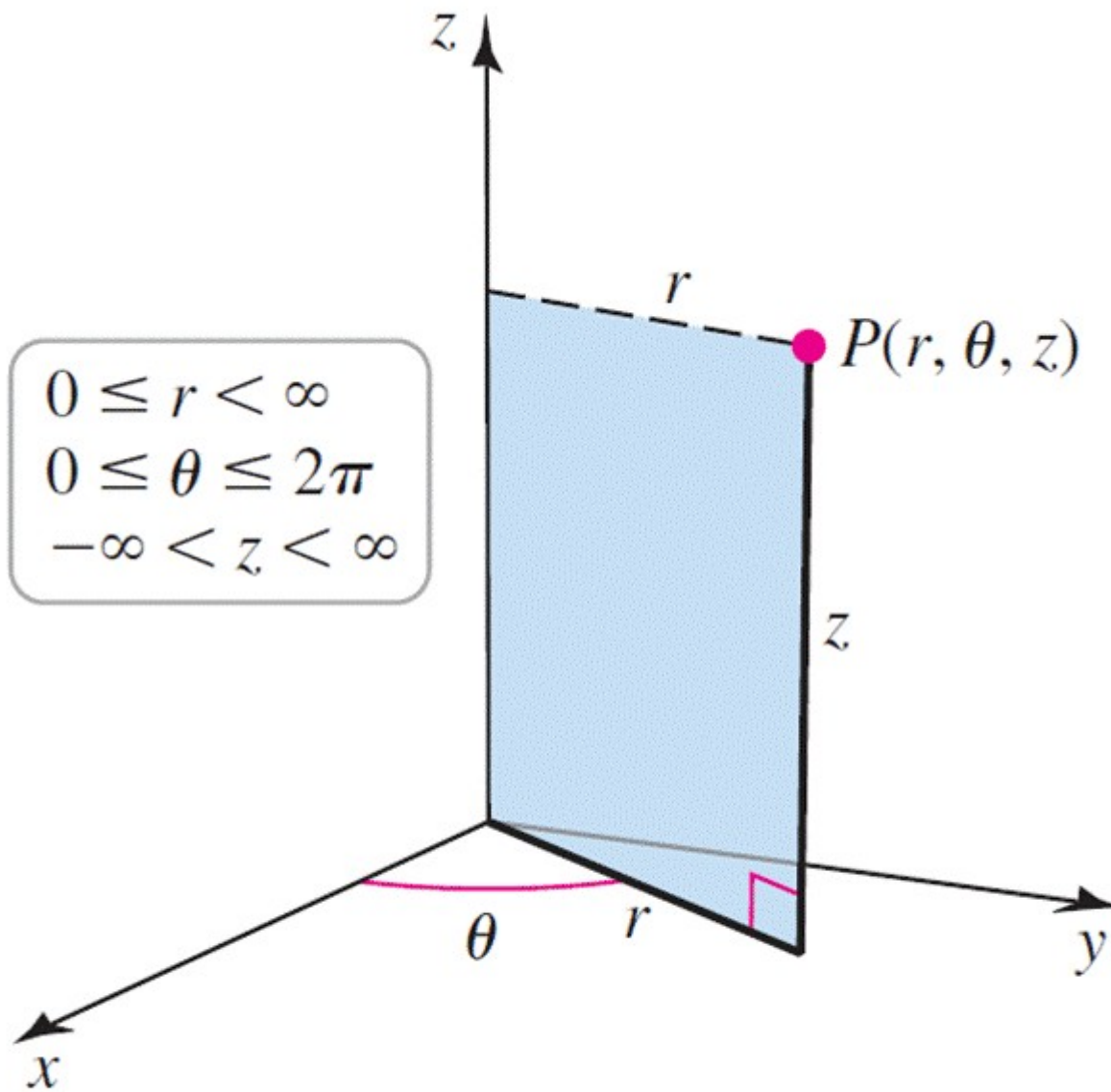
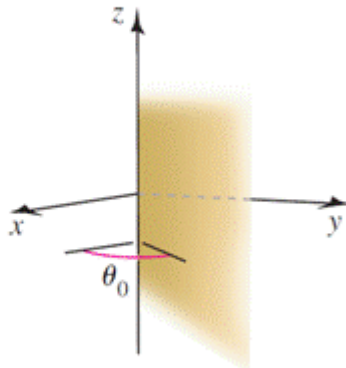
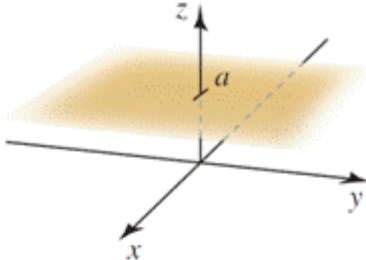
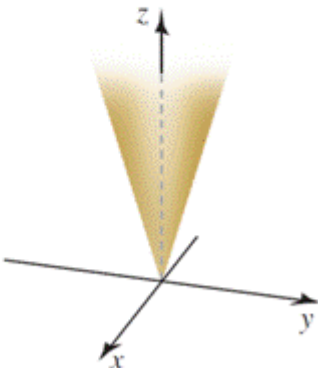


FIGURE 13.46

Table 13.3

Name	Description	Example
Cylinder	$\{(r, \theta, z): r = a\}, a > 0$	
Cylindrical shell	$\{(r, \theta, z): 0 < a \leq r \leq b\}$	

Table 13.3 (Continued)

Name	Description	Example
Vertical half plane	$\{(r, \theta, z): \theta = \theta_0\}$	
Horizontal plane	$\{(r, \theta, z): z = a\}$	
Cone	$\{(r, \theta, z): z = ar\}, a \neq 0$	

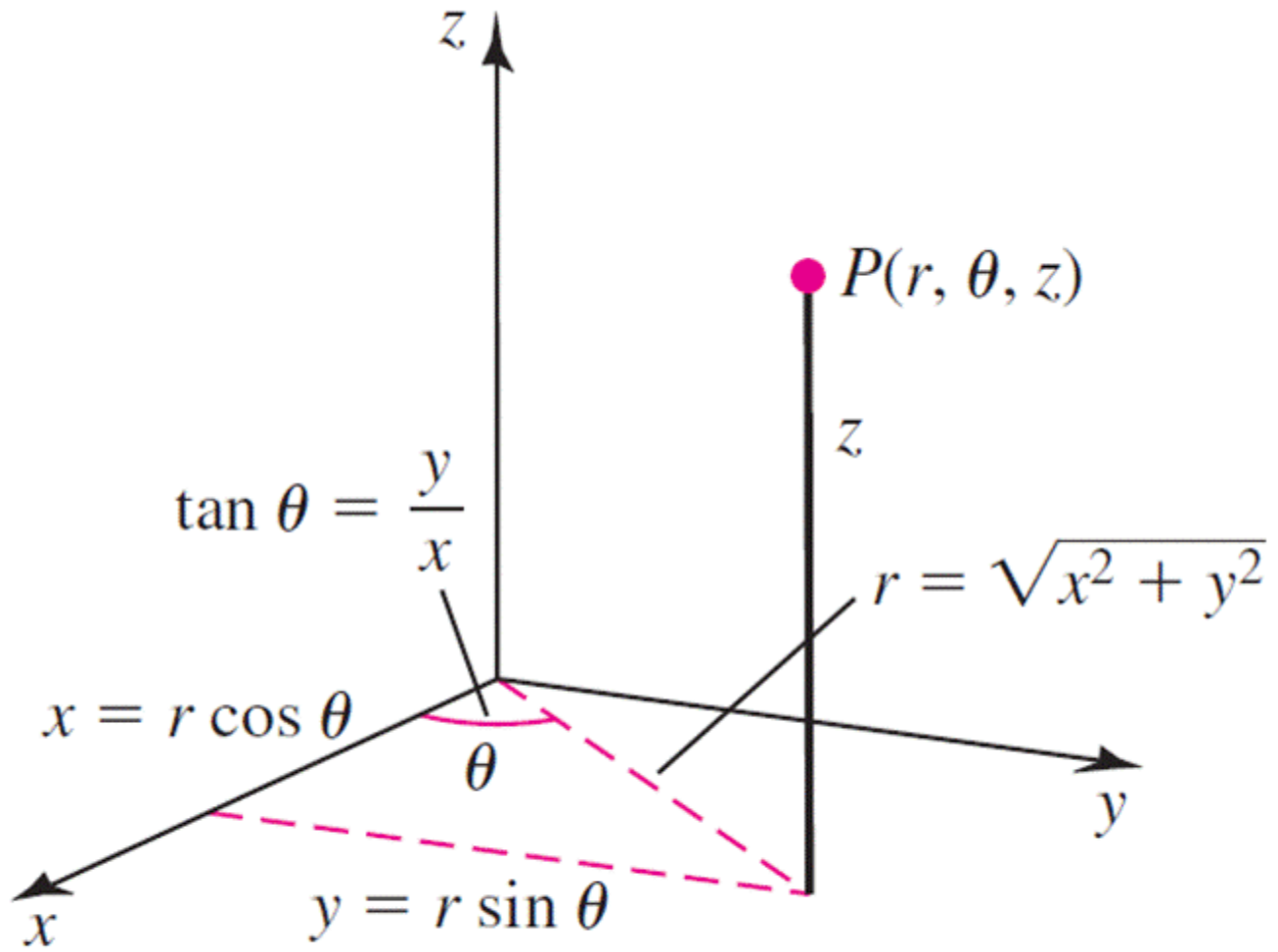


FIGURE 13.48

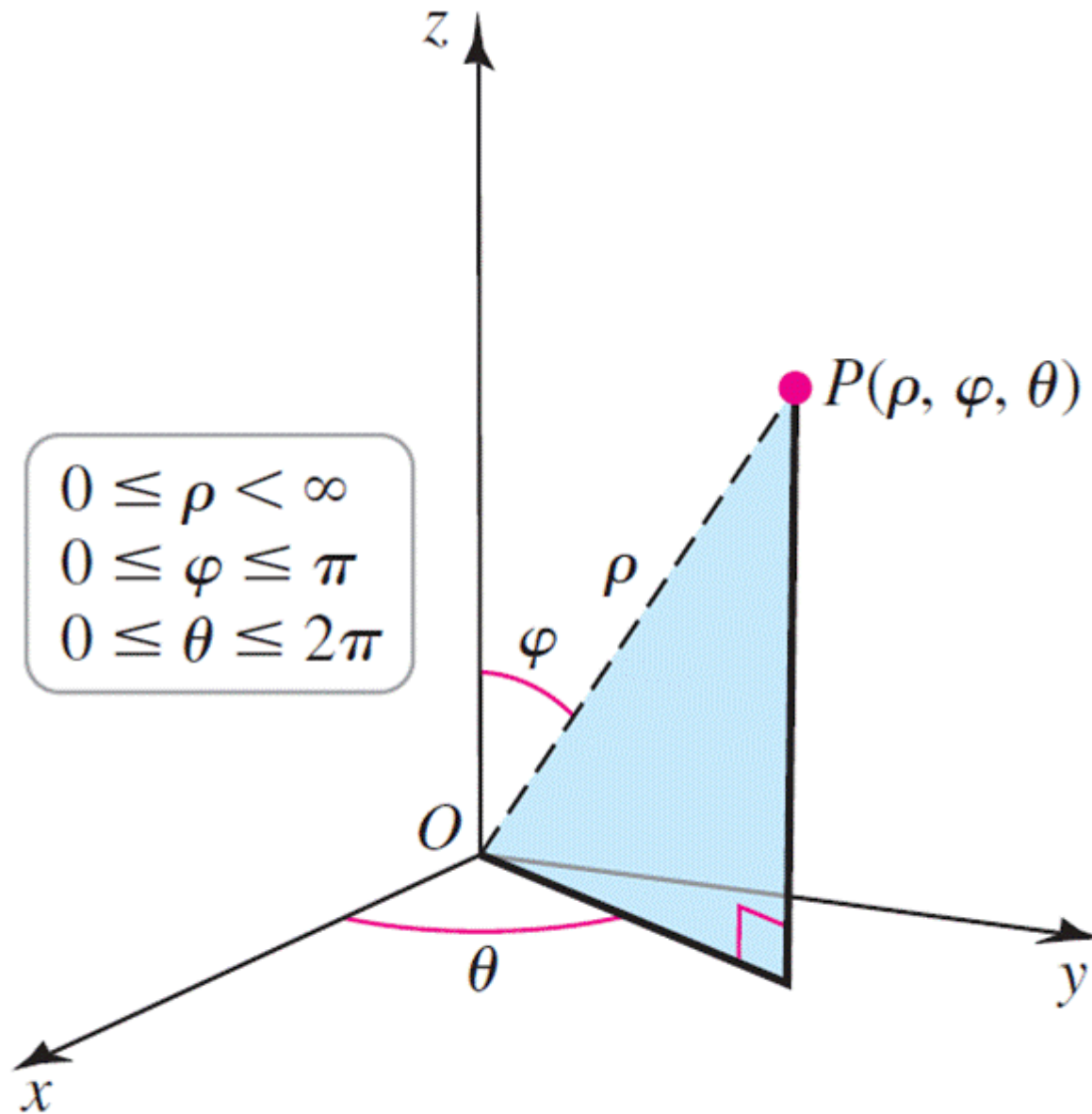


FIGURE 13.54

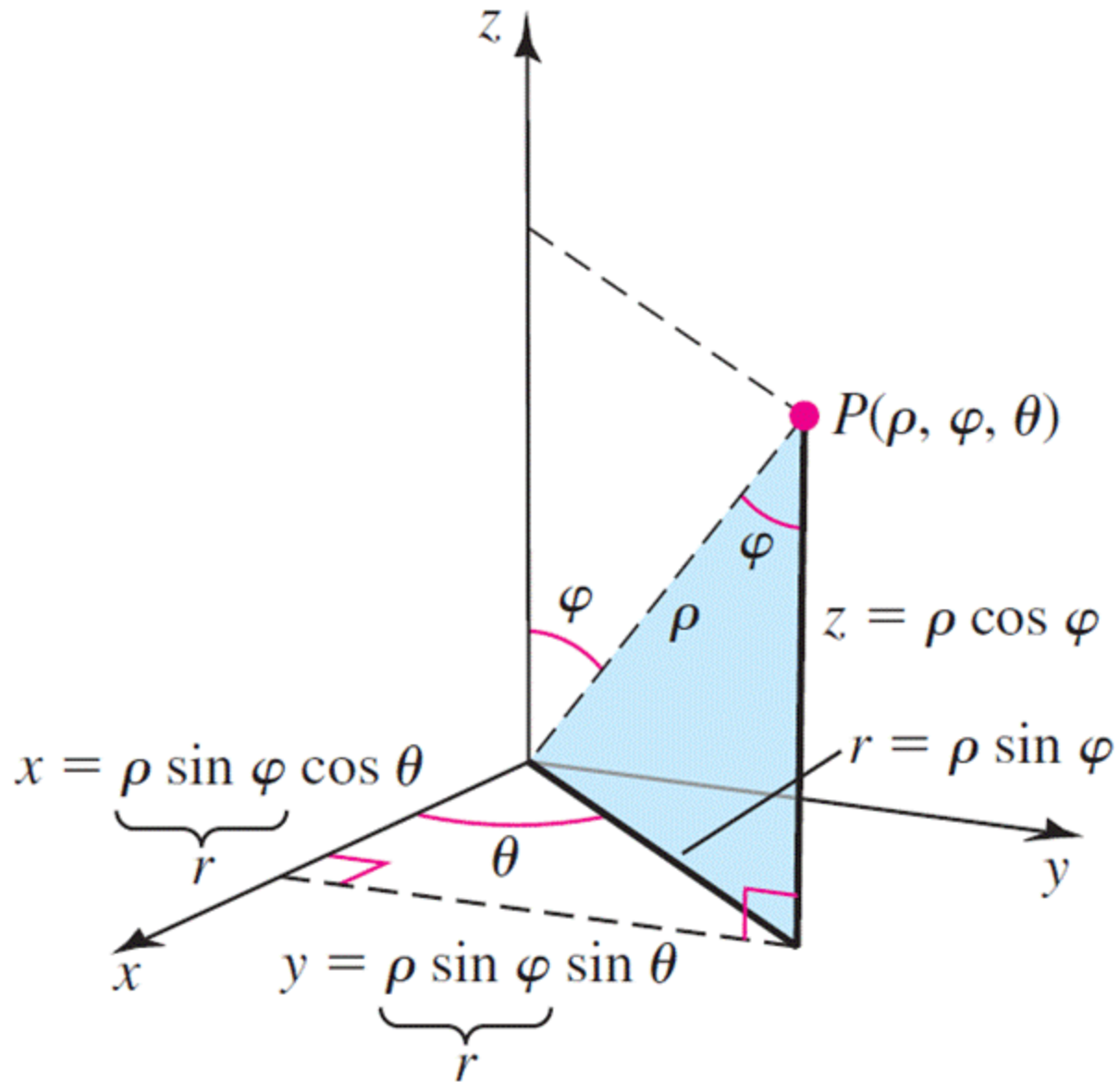
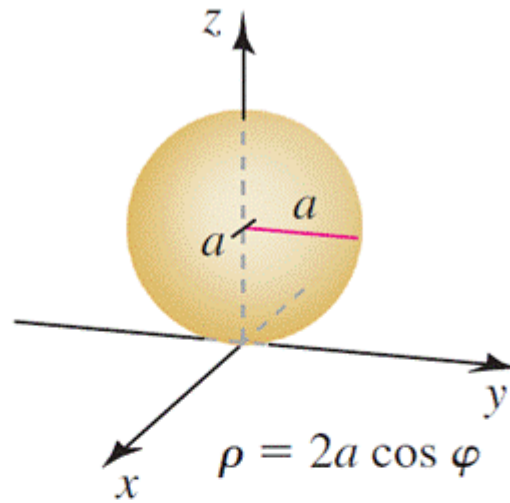
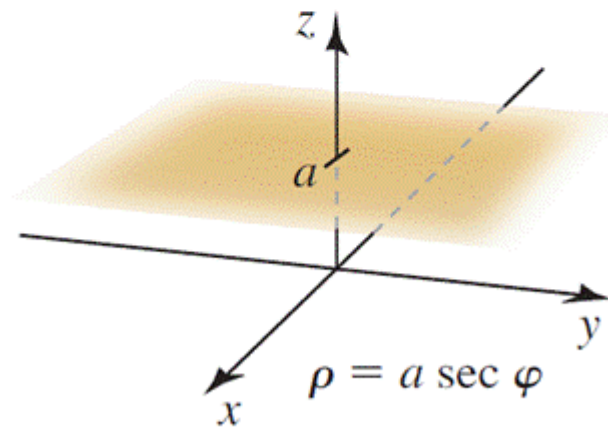


FIGURE 13.55



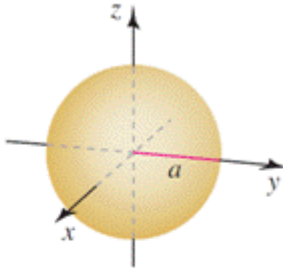
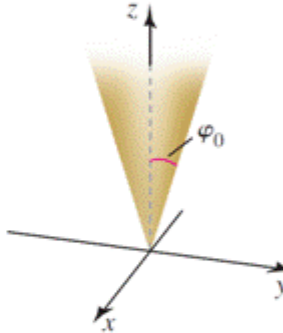
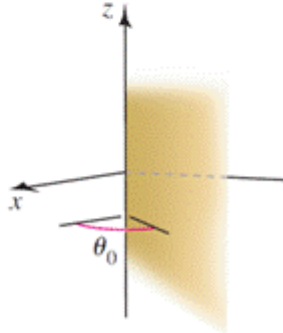
(a)



(b)

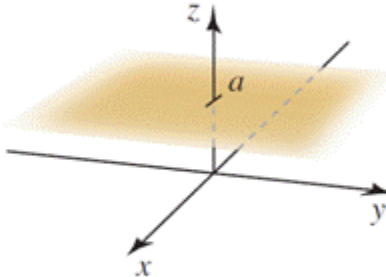
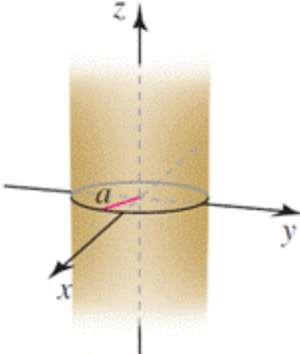
FIGURE 13.56

Table 13.4

Name	Description	Example
Sphere, radius a , center $(0, 0, 0)$	$\{(\rho, \varphi, \theta): \rho = a\}, a > 0$	
Cone	$\{(\rho, \varphi, \theta): \varphi = \varphi_0\}, \varphi_0 \neq 0, \pi/2, \pi$	
Vertical half plane	$\{(\rho, \varphi, \theta): \theta = \theta_0\}$	

(Continued)

Table 13.4 (Continued)

Name	Description	Example
Horizontal plane, $z = a$	$\{(\rho, \varphi, \theta): \rho = a \sec \varphi, 0 \leq \varphi < \pi/2\}$	
Cylinder, radius $a > 0$	$\{(\rho, \varphi, \theta): \rho = a \csc \varphi, 0 < \varphi < \pi\}$	
Sphere, radius $a > 0$, center $(0, 0, a)$	$\{(\rho, \varphi, \theta): \rho = 2a \cos \varphi, 0 \leq \varphi \leq \pi/2\}$	