EXAMPLE 1 Sketch the graph of the surface $z = x^2$.

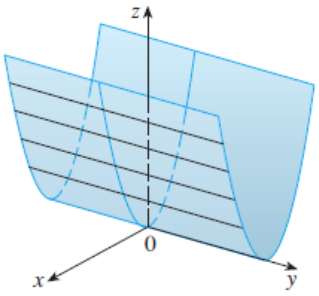


FIGURE 1
The surface $z = x^2$ is a parabolic cylinder.

EXAMPLE 2 Identify and sketch the surfaces.

(a) $x^2 + y^2 = 1$

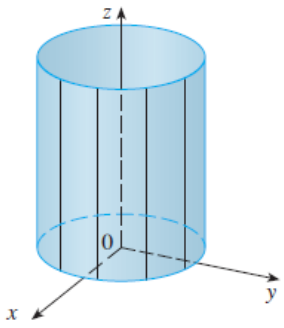


FIGURE 2 $x^2 + y^2 = 1$

(b) $y^2 + z^2 = 1$

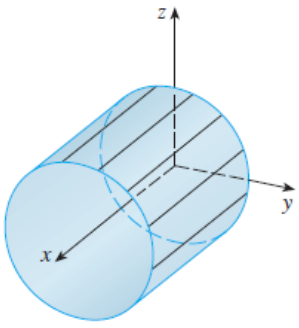


FIGURE 3 $y^2 + z^2 = 1$

EXAMPLE 3 Use traces to sketch the quadric surface with equation

$$x^2 + \frac{y^2}{9} + \frac{z^2}{4} = 1$$

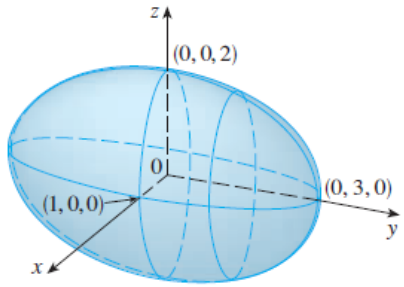
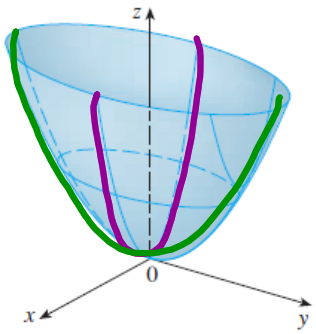


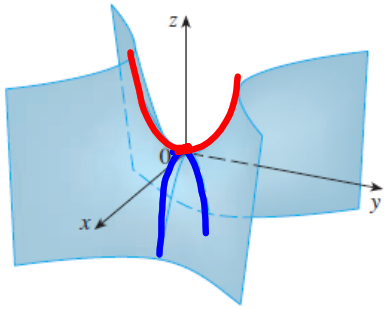
FIGURE 4

The ellipsoid $x^2 + \frac{y^2}{9} + \frac{z^2}{4} = 1$

EXAMPLE 4 Use traces to sketch the surface $z = 4x^2 + y^2$.



EXAMPLE 5 Sketch the surface $z = y^2 - x^2$.



EXAMPLE 6 Sketch the surface $\frac{x^2}{4} + y^2 - \frac{z^2}{4} = 1$.

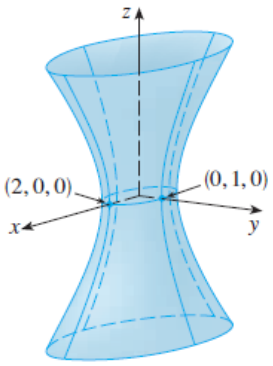


FIGURE 9