Surfaces in 3D-Space (Review)

Recall from Math 21C that you can use the following "tools" to sketch a surface in 3D-Space:

1. Intercepts
2. Traces
3. Level Curves

Example: Sketch the following surfaces in 3D-Space.

1.) $y = 3$
2.) \(2x + 3z = 6\)  
(Plane parallel to y-axis)

3.) \(x + 2y + 4z = 8\)  
(Tilted plane)

4.) \(x^2 + y^2 + z^2 = 9\)  
(Sphere of radius 3 centered at \((0, 0, 0)\))
5.) $z = x^2$
(parabolic cylinder, parallel to the $y$-axis)

6.) $x^2 + y^2 = 4$
(circular cylinder, parallel to the $z$-axis of radius 2)

7.) $z = \sqrt{x^2 + y^2}$
(cone)
8.) \( z = y^2 - x^2 \)
(hyperbolic paraboloid or saddle)

9.) \( x^2 + y^2 = 4 + z^2 \)
(hyperboloid of one sheet parallel to the z-axis)