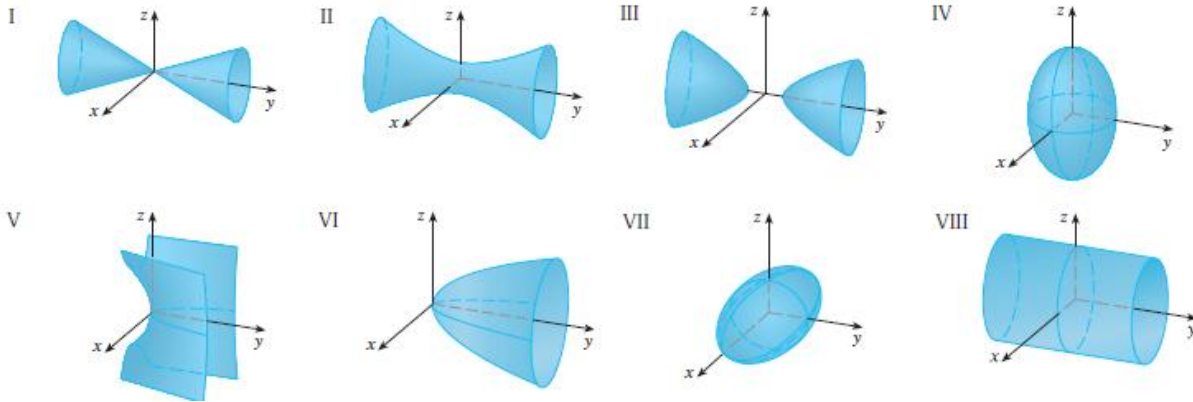


Problem Set 7

1. Describe and sketch the surface of $x^2 + y^2 = 1$.
2. Describe and sketch the surface of $xy = 1$.
3. Use traces to sketch and identify the surface of $9x^2 - y^2 + z^2 = 0$.
4. Use traces to sketch and identify the surface of $4x^2 + 9y^2 + z = 0$.



5. Match the equation of $x^2 + 4y^2 + 9z^2 = 1$ to one of the graphs above.
6. Match the equation of $x^2 - y^2 + z^2 = 1$ to one of the graphs above.
7. Reduce the equation $y^2 = x^2 + 4z^2 + 4$ to one of the standard forms, classify the surface, and sketch it.
8. Reduce the equation $4x^2 + y^2 + 4z^2 - 4y - 24z + 36 = 0$ to one of the standard forms, classify the surface, and sketch it.
9. Find an equation for the surface obtained by rotating the parabola $y = x^2$ about the y-axis.
10. A cooling tower for a nuclear reactor has the shape of a hyperboloid of one sheet with a diameter at the base of 280m and a minimum diameter, 500m above the base, of 200m. Find an equation for the tower.