13. An equation of the sphere with center $(-3, 2, 5)$ and radius 4 is $[x - (-3)]^2 + (y - 2)^2 + (z - 5)^2 = 4^2$ or $(x + 3)^2 + (y - 2)^2 + (z - 5)^2 = 16$. The intersection of this sphere with the yz-plane is the set of points on the sphere whose x-coordinate is 0. Putting $x = 0$ into the equation, we have $9 + (y - 2)^2 + (z - 5)^2 = 16$, $x = 0$ or $(y - 2)^2 + (z - 5)^2 = 7$, $x = 0$, which represents a circle in the yz-plane with center $(0, 2, 5)$ and radius $\sqrt{7}$.

14. An equation of the sphere with center $(2, -6, 4)$ and radius 5 is $(x - 2)^2 + [y - (-6)]^2 + (z - 4)^2 = 5^2$ or $(x - 2)^2 + (y + 6)^2 + (z - 4)^2 = 25$. The intersection of this sphere with the xy-plane is the set of points on the sphere whose z-coordinate is 0. Putting $z = 0$ into the equation, we have $(x - 2)^2 + (y + 6)^2 = 9$, $z = 0$ which represents a circle in the xy-plane with center $(2, -6, 0)$ and radius 3. To find the intersection with the xz-plane, we set $y = 0$: $(x - 2)^2 + (z - 4)^2 = -11$. Since no points satisfy this equation, the sphere does not intersect the xz-plane. (Also note that the distance from the center of the sphere to the xz-plane is greater than the radius of the sphere.) To find the intersection with the yz-plane, we set $x = 0$: $(y + 6)^2 + (z - 4)^2 = 21$, $x = 0$, a circle in the yz-plane with center $(0, -6, 4)$ and radius $\sqrt{21}$.

15. The radius of the sphere is the distance between $(4, 3, -1)$ and $(3, 8, 1)$: $r = \sqrt{(3-4)^2 + (8-3)^2 + [1-(-1)]^2} = \sqrt{30}$. Thus, an equation of the sphere is $(x - 3)^2 + (y - 8)^2 + (z - 1)^2 = 30$.

19. Completing squares in the equation $2x^2 - 8x + 2y^2 + 2z^2 + 24z = 1$ gives

$2(x^2 - 4x + 4) + 2y^2 + 2(z^2 + 12z + 36) = 1 + 8 + 72 \quad \Rightarrow \quad 2(x - 2)^2 + 2y^2 + 2(z + 6)^2 = 81 \quad \Rightarrow$

$(x - 2)^2 + y^2 + (z + 6)^2 = \frac{81}{2}$, which we recognize as an equation of a sphere with center $(2, 0, -6)$ and radius $\sqrt{\frac{81}{2}} = 9/\sqrt{2}$.

29. The inequality $0 \le z \le 6$ represents all points on or between the horizontal planes $z = 0$ (the xy-plane) and $z = 6$.

35. The inequalities $1 \le x^2 + y^2 + z^2 \le 5$ are equivalent to $1 \le \sqrt{x^2 + y^2 + z^2} \le \sqrt{5}$, so the region consists of those points whose distance from the origin is at least 1 and at most $\sqrt{5}$. This is the set of all points on or between spheres with radii 1 and $\sqrt{5}$ and centers $(0, 0, 0)$.

36. The equation $x = z$ represents a plane perpendicular to the xz-plane and intersecting the xz-plane in the line $x = z$, $y = 0$.

45. We need to find a set of points $\{P(x, y, z) \mid |AP| = |BP|\}$.

$\sqrt{(x+1)^2 + (y-5)^2 + (z-3)^2} = \sqrt{(x-6)^2 + (y-2)^2 + (z+2)^2} \quad \Rightarrow$

$(x + 1)^2 + (y - 5) + (z - 3)^2 = (x - 6)^2 + (y - 2)^2 + (z + 2)^2 \quad \Rightarrow$

$x^2 + 2x + 1 + y^2 - 10y + 25 + z^2 - 6z + 9 = x^2 - 12x + 36 + y^2 - 4y + 4 + z^2 + 4z + 4 \quad \Rightarrow \quad 14x - 6y - 10z = 9$.

Thus the set of points is a plane perpendicular to the line segment joining A and B (since this plane must contain the perpendicular bisector of the line segment AB).