12.6, number 12: **Which picture from (a)–(l) corresponds to**

$$9x^2 + 4y^2 + 2z^2 = 36?$$

Answer:

When $x = 0$, the equation describes an ellipse in the yz-plane.

When $y = 0$, the equation describes an ellipse in the xz-plane.

When $z = 0$, the equation describes an ellipse in the xy-plane.

The total graph is an ellipsoid. So it is either (c) or (d). Now we look at a few of the points on the surface: $(2, 0, 0)$, $(0, 3, 0)$, and $(0, 0, \sqrt{18})$. So the graph is longer in the z-direction than it is in either the x-direction or the y-direction. The graph must be $\boxed{c}$.