12.6, number 9: **Which picture from (a)–(l) corresponds to**

$$x = z^2 - y^2?$$

**Answer:**

When $x = 0$, the equation describes two lines in the $yz$-plane.

When $y = 0$, the equation describes a parabola in the $xz$-plane. This parabola has $x$ always positive.

When $z = 0$, the equation describes a parabola in the $xy$-plane. This parabola has $x$ always negative.

The total graph is a hyperbolic paraboloid. The answer is either (k) or (l). Notice the intersection of (k) with the $xz$ plane has $x$ always positive. The intersection of (l) with the $xz$-plane has $x$ always negative. The graph must be $\boxed{k}$.