12.6, number 5: **Which picture from (a)–(l) corresponds to**

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

Answer:

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

When x is a nonzero constant then the equation describes a hyperbola.

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

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

The graph is a hyperbolic paraboloid. The answer is either k or l. Observe that in k, the intersection of the graph with the xz plane has x positive. On the other hand, the intersection of the graph of l with the xz-plane has x always negative.

The answer is $\boxed{l}$.