

Name: _____

ID: _____

1. Consider the surface

$$z^2 - 4x^2 - y^2 = 4.$$

- (a) Identify the horizontal traces of the surface in the planes $z = k$. If the answer depends on the value of k , be sure to specify which values of k give which answer.
- (b) Identify the vertical traces of the surface in the planes $x = k$. If the answer depends on the value of k , be sure to specify which values of k give which answer.
- (c) Identify the vertical traces of the surface in the planes $y = k$. If the answer depends on the value of k , be sure to specify which values of k give which answer.
- (d) Identify the surface.
- (e) Sketch the surface. Your sketch does not need to be quantitatively correct, but it should show the correct type of surface in the correct orientation.

2. Sketch the curve in two-dimensional space with the vector equation

$$\mathbf{r}(t) = \sin(t)\mathbf{i} + t\mathbf{j}.$$

Include an arrow to show the direction in which t increases.