PRINT Your Name:_____

The quiz is worth 5 points. **Remove EVERYTHING from your desk except this quiz and a pen or pencil.** SHOW your work. Express your work in a neat and coherent manner.

The answer: In (a), $x^2 + y^2 = 4(1 + z^2)$ and this is $\frac{x^2}{4} + \frac{y^2}{4} - z^2 = 1$. So when z is constant, we pick up circles of growing radii. When x is zero, the graph is a hyperbola. When y is zero, the graph is a hyperbola. The graph is (iii).

In (b), the surface is $\frac{x^2}{9} + \frac{y^2}{4} + z^2 = 1$. This is an ellipsoid. The graph is (i).

In (c), the surface is $z = x^2$ and y can be anything. The graph is (ii).

In (d), the surface is $x^2 + y^2 = z^2$. This is a cone. The graph is (iv).
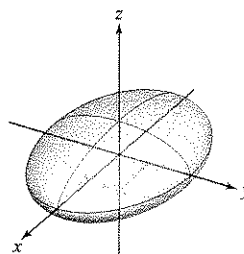
The question:

Match the following parameterizations to the surfaces shown in the figures.

(a) $\Phi(u, v) = ((2\sqrt{1 + u^2}) \cos v, (2\sqrt{1 + u^2}) \sin v, u)$
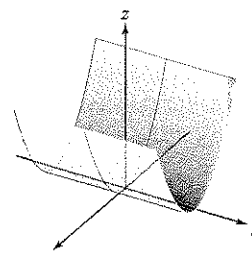
(b) $\Phi(u, v) = (3 \cos u \sin v, 2 \sin u \sin v, \cos v)$
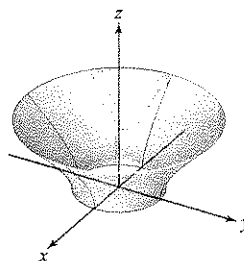
(c) $\Phi(u, v) = (u, v, u^2)$
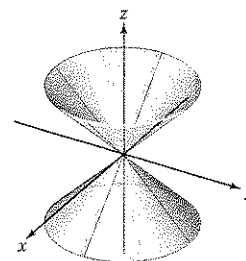
(d) $\Phi(u, v) = (u \cos v, u \sin v, u)$

(i)

(ii)

(iii)

(iv)