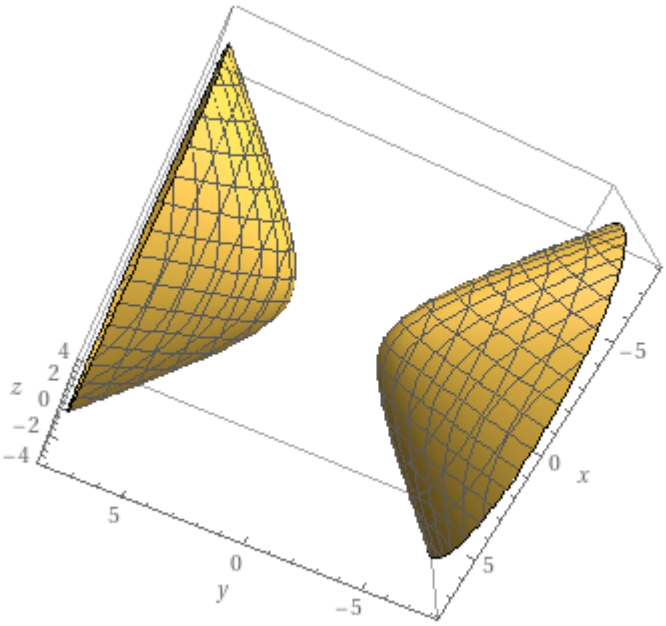
1 Math 215 Homework 4 Question 7

Reduce to Standard Form and State the shape

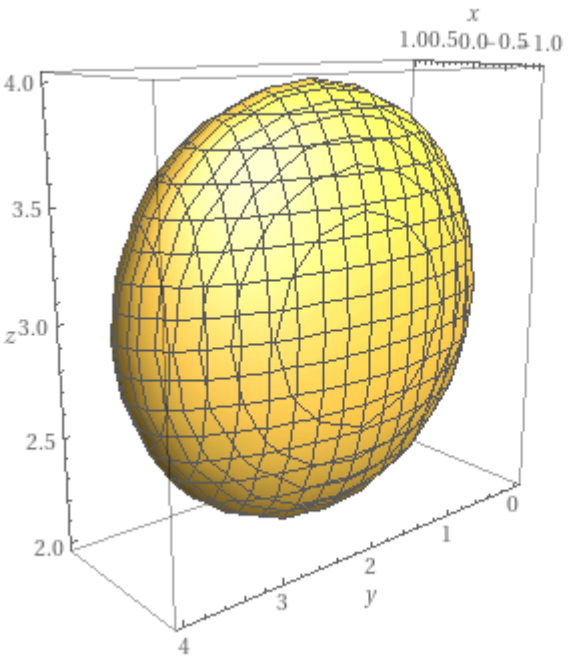
24: $y^2 = x^2 + 4z^2 + 4$
$y^2 - x^2 - 4z^2 = 4$
$\frac{y^2}{4} - \frac{x^2}{4} - z^2 = 1$

shape is a hyperboliod of two sheets



25: $4x^2 + y^2 + 4z^2 - 4y - 24z + 36 = 0$
$4x^2 + y^2 + 4(z^2 - 6z + 9) = 0$
$4x^2 + y^2 - 4y + 4(z - 3)^2 = 0$
$4x^2 + y^2 - 4y + 4 + 4(z - 3)^2 = 4$
$4x^2 + (y - 2)^2 + 4(z - 3)^2 = 4$
$x^2 + \frac{(y-2)^2}{4} + (z - 3)^2 = 1$

shape is an ellipsoid



26: $4y^2 + z^2 - x - 16y - 4z + 20 = 0$
$4y^2 - 16y + 16 + z^2 - 4z + 4 = x$
$4(y^2 - 4y + 4) + z^2 - 4z + 4 = x$
$4(y - 2)^2 + (z - 2)^2 = x$
$(y - 2)^2 + \frac{(z-2)^2}{4} = \frac{x}{4}$

shape is an elliptic parabaloid