3. *[3 pts.]* Consider the quadric surface $z^2 = 4 + x^2 + 4y^2$. Find the traces (write **equations** and the **names** of the curves) of this surfacein the planes

(a) $z = 3$: $9 = 4 + x^2 + 4y^2$

$5 = x^2 + 4y^2$ 0.5pt

0.5pt ellipse

(b) $x = 2$: $z^2 = 4 + 4 + 4y^2$

$z^2 - 4y^2 = 8$ 0.5pt

0.5pt hyperbola

(c) $y = 0$: $z^2 = 4 + x^2$

$z^2 - x^2 = 4$ 0.5pt

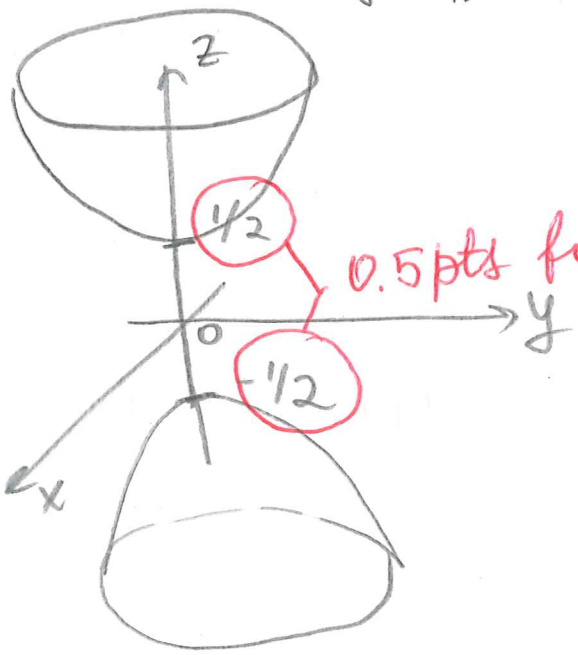
0.5pt hyperbola

4. *[2 pts.]* Classify the surface $4z^2 - x^2 - y^2 = 1$ and sketch it.

0.5pt

hyperboloid of two sheets 1pt

is not defined for $|z| < \frac{1}{2}$



0.5pts for both

1pt for the graph.