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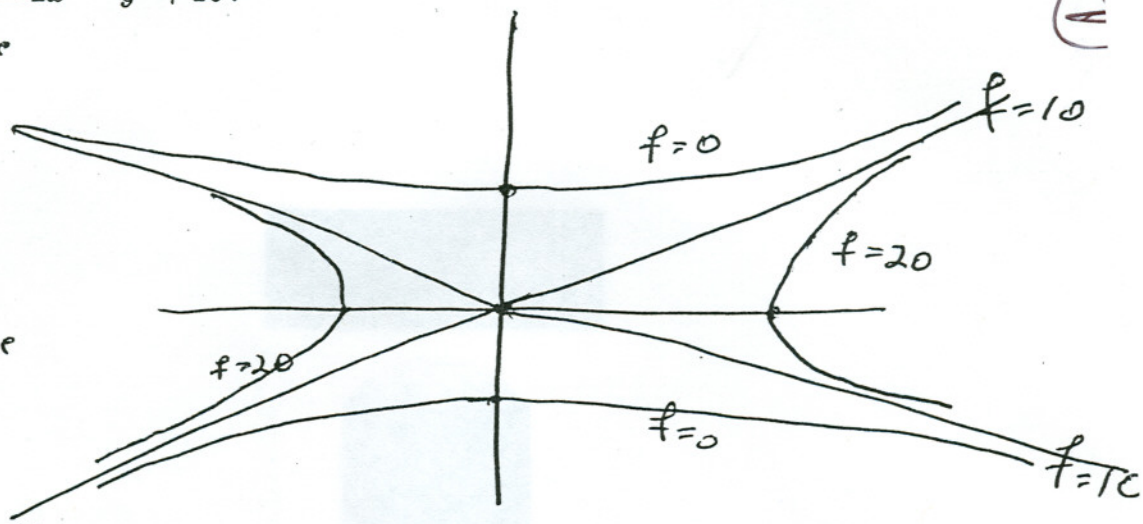
8. Graph and label the level sets $f = 0$, $f = 10$, and $f = 20$ for $f(x, y) = 2x^2 - y^2 + 10$.

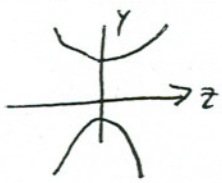
when $f=0$, we have
$0 = 2x^2 - y^2 + 10$
$y^2 - 2x^2 = 10$
$\frac{y^2}{10} - \frac{x^2}{5} = 1$
a hyperbola
when $f=10$, we have
$10 = 2x^2 - y^2 + 10$
$2x^2 = y^2$
2 lines
when $f=20$, we have
$20 = 2x^2 - y^2 + 10$
$10 = 2x^2 - y^2$
$1 = \frac{x^2}{5} - \frac{y^2}{10}$
a hyperbola



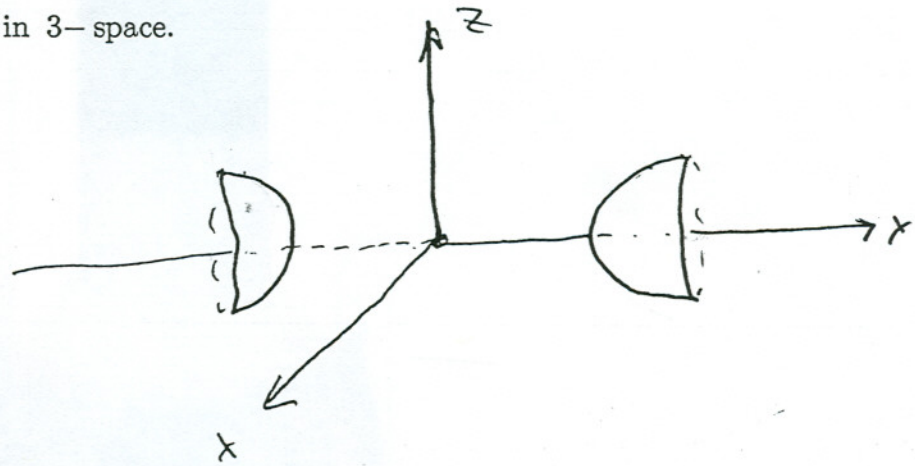
9. Graph $y^2 - \frac{x^2}{4} - \frac{z^2}{9} = 1$ in 3−space.

when $z=0$ we have a hyperbola

when $x=0$ hyperbola



No graph when $y=0$
when y is large
the cross section is
an ellipse
if y is less than -1, then
the cross section is
an ellipse



" hyperboloid of 2 sheets "