Math 21D
Vogler
Worksheet 1
Intersections of Surfaces, Projections

1.) Sketch each pair of surfaces and their intersection on the same set of axes. On a separate set of axes plot the projection of this intersection in the xy-plane.

a.) $x + 2y + 3z = 6$ and $z = x$

b.) $z = x^2 + y^2$ and $z = 4$

c.) $z = 2x^2 + 2y^2$ and $z = y + 1$

d.) $z = x^2 + y^2$ and $z = 4 - 3x^2$

e.) $z = \sqrt{x^2 + y^2}$ and $z = 6 - x^2 - y^2$

f.) $x^2 + y^2 + z^2 = 9$ and $y = x$

g.) $x^2 + z^2 = y^2 + 3$ and $z = 2$

h.) $x^2 + y^2 - z^2 = 0$ and $z = y + 1$

2.) Consider the intersection of the surfaces $z = x^2 + y - 1$ and $y = x^2 + 1$. Plot the projection of this intersection in the

a.) xz-plane.

b.) yz-plane.

c.) xy-plane.