

Math 21C
Kouba
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.