

Math 241 Class Exercise: Multivariable Functions and
Graphing part 3
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For the following exercises, graph the functions as accurately as possible. Keep in mind that the best way is to look at cross sections. In general, a good starting point is to look at the curves in the x - y , x - z , y - z planes obtained by setting the values $z = 0$, $y = 0$, and $x = 0$ respectively. Also look at the level curves ($z = k$) as well as those obtained from setting $x = \text{constant}$ and $y = \text{constant}$.

1. Accurately graph the function $z = f(x, y) = \sqrt{36 - 9x^2 - 4y^2}$. First step should be to find the domain and range.
2. Accurately graph the function $z = f(x, y) = x^2 + 9y^2$. First step should be to find the domain and range.
3. Accurately graph the function $z = f(x, y) = \sin(x - y)$. First step should be to find the domain and range.