Unit 10: Functions

1 Compute the limit $\tan(t)/t$ for $t \to 0$ using l'Hopital.

2 Compute the limit $(x^2-1)/(x^2+1)$ for $x \to \infty$ using l'Hopital.

3 Compute the limit $\sin^2(x)/x^2$ for $x \to 0$ using l'Hopital

4 Is the function $f(x,y) = (x^4 + y^4)/(x^2 + y^2)^2$ with $f(0,0) = 0$ continuous?

5 Is the curve
$$\vec{r}(t) = [\cos(t), \sin(t), \sin(t)/t]$$
with $\vec{r}(0) = [1, 0, 1]$ continuous?

6 Can you plot the surface
$$\vec{r}(\theta, z) = [\cos^3(\theta), \sin^3(\theta), z] \ ?$$