Lab 10 Write-up

**Function 4:**

***Zero:*** *x = 1:*

While playing with the 3rd function, I decided to put as interval -2 and 2, the graph was going through infinity in a place that seems to be in the positive side next to 2 (so neighboring 1, or a bit more than 1) so to find one of the zeroes, I chose a small interval [0,2] and the graph was crossing the x-axis right in the middle and when I chose [1,2], it was crossing right at the extremities, so my guess of it being around 1 was correct. And because while going close to this root and there is no change of orientation of the graph, I can assume that 1 is the only root.

**Function 5:**

I hesitated between putting an if-else statement or not because if if 1/x is undefined we know in math that it is really because it is going to Infinity, but it does not make sin undefined because sin is periodical. So, I just tweaked things around only setting 1/x to the maximum value to observe the behavior of sin. Starting with a big interval [-15, 15] the graph was going crazy in the middle, going up and down very fast, I reduced my interval to observe the behavior more deeply. In the neighboring of 0, the sin(1/x) function has a very short period which makes it go up and down very fast. Because of that we can assume that the limit of f(x) is 0.

The further apart we go from x = 0, the graph resembles 1/x. However, is it to be expected because in math we know that when the value of x is small sin(x) is approximately x. This is the case because we know that the bigger the x the closest 1/x is to 0.