**Use the definition of limits** to verify that

We need to check that, given any there is some such that if, then

Given an we reverse engineer the .

<=>

<=>

<=>

So does the job: if we can trace the equivalents backward to get

.

**Graphing**

Find the domain, intercepts maxima and minima, and vertical and horizontal asymptotes of

and sketch its graph.

Domain: because make snese for all and

x intercept: None because is never 0

y intercept:

Domain has no end points so we only have to check for critical points.

Critical Points

when

is undefined when

Denominator is never equal to zero

|  |  |  |  |
| --- | --- | --- | --- |
| x |  | 1 |  |
|  | + | 0 | + |
|  | increasing | neither max nor min | increasing |

Vertical Asymptotes: None. is defined & continuous everywhere

|  |  |
| --- | --- |
| Horizontal Asymptotes:  Using l’Hopital’s Rule:  Using l’Hopital’s Rule: | So we have a horizontal asymptote of in the negative direction and none in the positive |