2. Determine the domain of f(x) and find any asymptotes.

$$f(x)=\frac{x^2-x}{x+1}$$

What about slant asymptotes?

Horizontal Asymptotes

To find horizontal asymptotes 1 test must be applied. The asymptotes can be determined simply by looking at the degree of the numerator and the degree of the denominator.

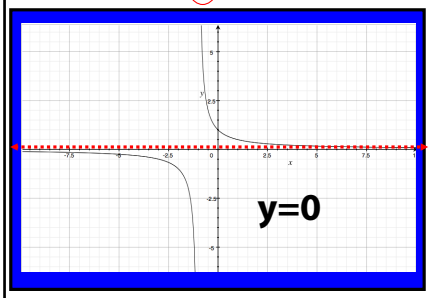
If the denominator has a larger degree we have a horizontal asymptote at y = 0.

If the numerator and denominator are equal in degree the we have a horizontal asymptote exactly at the division of the leading coefficients.

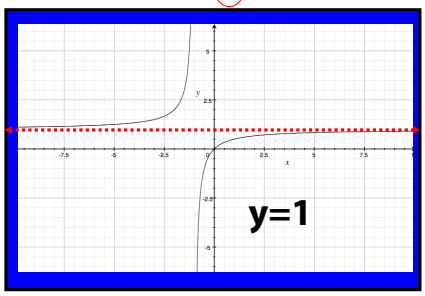
If the numerator is greater than the denominator then we have no horizontal asymptote.

In the case where the degree of the numerator is exactly one greater than the degree of the denominator we have a slant asymptote.

$$f(x)=\frac{x-1}{x^2-1}$$



$$f(x)=\frac{x^2-x}{x^2-1}$$



$$f(x)=\frac{x^2-x}{x+1}$$

A little note about **vertical asymptotes**. To find a vertical asymptote, set the denominator equal to zero and solve for x.

$$x+1=0$$
$$x=-1$$

We must use long division to find the slant asymptote.

$$\begin{array}{r} x-2 \\ x+1\overline{)\,x^2-x} \\ \underline{-x^2-x} \\ -2x \\ \underline{2x} \\ 0 \end{array}$$

We can see here the two asymptotes. One vertical **(x = -1)** and one slant **(y=x-2)**.