

2.

It so happens that this function can be simplified as:

$$\begin{aligned}n(p) &= \frac{-8+p^3}{-8+2p+p^2} \\&= \frac{(p-2)(p^2+2p+4)}{(p-2)(p+4)} \\&= \frac{p^2+2p+4}{p+4}\end{aligned}$$

To find the vertical asymptote :

$$p+4=0$$

$$p=-4$$

There is a vertical asymptote at $p=-4$

To find the horizontal asymptote :

First we must compare the degrees of the polynomials.

The numerator contains a 3rd degree polynomial while the

denominator contains a 2nd degree polynomial.

Since the polynomial in the numerator is a higher degree than the denominator, there is no horizontal asymptote.

To find the oblique asymptote :

we must divide the numerator by the denominator $\frac{-8+p^3}{-8+2p+p^2} = \frac{p^2+2p+4}{p+4} = \frac{12}{p+4} + (p-2)$

There is an oblique asymptote at $j=p-2$

