

5.

It so happens that this function can be simplified as:

$$\begin{aligned} j(t) &= \frac{-1+t^3}{-2+t+t^2} \\ &= \frac{(t-1)(t^2+t+1)}{(t-1)(t+2)} \\ &= \frac{t^2+t+1}{t+2} \end{aligned}$$

To find the vertical asymptote :

$$t+2=0$$

$$t=-2$$

There is a vertical asymptote at $t=-2$

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 $\frac{-1+t^3}{-2+t+t^2} = \frac{t^2+t+1}{t+2} = \frac{3}{t+2} + (t-1)$

There is an oblique asymptote at $n=t-1$

