1.

It so happens that this function can be simplified as:

$$q(v) = \frac{-1+v^3}{-5+4v+v^2}$$

$$= \frac{(v-1)\left(v^2+v+1\right)}{(v-1)(v+5)}$$

$$= \frac{v^2+v+1}{v+5}$$

To find the vertical asymptote :

$v + 5 = 0$

$v = -5$

There is a vertical asymptote at $v = -5$

To find the horizontal asymptote :

First we must compare the degrees of the polynomials.

The numerator contains a 3^{rd} degree polynomial while the denominator contains a 2^{nd} 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 $\frac{-1+v^3}{-5+4v+v^2} = \frac{v^2+v+1}{v+5} = \frac{21}{v+5} + (v-4)$

There is an oblique asymptote at $t = v - 4$