4.

It so happens that this function can be simplified as:

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

$$= \frac{(a-1)\left(a^2+a+1\right)}{(a-1)\,(a+1)}$$

$$= \frac{a^2+a+1}{a+1}$$

To find the vertical asymptote :

$a + 1 = 0$

$a = -1$

There is a vertical asymptote at $a = -1$

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 $\frac{-1+a^3}{-1+a^2} = \frac{a^2+a+1}{a+1} = \frac{1}{a+1} + a$

There is an oblique asymptote at $s = a$