3.

It so happens that this function can be simplified as:

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

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

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

To find the vertical asymptote :

$w + 1 = 0$

$w = -1$

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

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

There is an oblique asymptote at $a = w$