

3.

To find the vertical asymptote :

We must set the denominator equal to 0 and solve:

$$w^4 - 625 = 0$$

$$(w^2 - 25)(w^2 + 25) = 0$$

$$(w^2 - 25) = 0$$

$$(w - 5)(w + 5) = 0$$

$$w = 5 \text{ or } w = -5$$

There is vertical asymptote at $w = 5$ and at $w = -5$

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 4th degree polynomial.

Since the polynomial in the numerator is a lower degree than the denominator, the horizontal asymptote is located at $b = 0$.

To find the oblique asymptote :

Since the degrees of the numerator are less than the degrees of the denominator, this rational does not have an oblique asymptote

