3.

It so happens that this function can be simplified as:

$$n(t) = \frac{-8+t^3}{-8+2t+t^2}$$

$$= \frac{(t-2)\,(t^2+2t+4)}{(t-2)\,(t+4)}$$

$$= \frac{t^2+2t+4}{t+4}$$

To find the vertical asymptote :

$t + 4 = 0$

$t = -4$

There is a vertical asymptote at $t = -4$

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 $\frac{-8+t^3}{-8+2t+t^2} = \frac{t^2+2t+4}{t+4} = \frac{12}{t+4} + (t-2)$

There is an oblique asymptote at $d = t - 2$