3.

It so happens that this function can be simplified as:

$$t(j) = \frac{-20+7j+3j^2}{4+j}$$

$$= \frac{(j+4)(3j-5)}{j+4}$$

$$= 3j - 5$$

To find the vertical asymptote :

There is no vertical asymptote

To find the horizontal asymptote :

First we must compare the degrees of the polynomials.

The numerator contains a 2^{nd} degree polynomial while the denominator contains a 1^{st} 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 and so the oblique asymptote $q = 3j - 5$