3.

It so happens that this function can be simplified as:

$$e(k) = \frac{-125+k^3}{-10-3k+k^2}$$

$$= \frac{(k-5)\left(k^2+5k+25\right)}{(k-5)(k+2)}$$

$$= \frac{k^2+5k+25}{k+2}$$

To find the vertical asymptote :

$$k+2=0$$

$$k=-2$$

There is a vertical asymptote at $k=-2$

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 $\frac{-125+k^3}{-10-3k+k^2} = \frac{k^2+5k+25}{k+2} = \frac{19}{k+2} + (k+3)$

There is an oblique asymptote at $r=k+3$