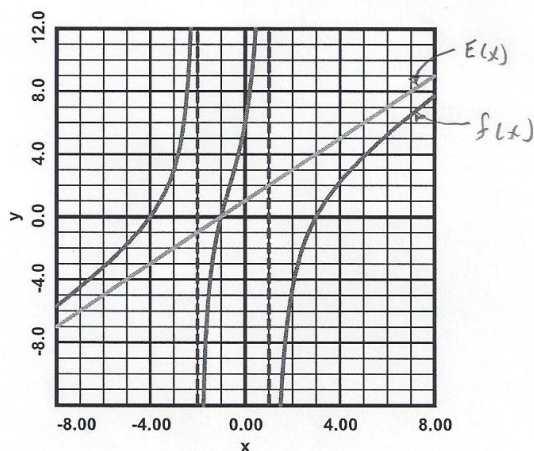


AP CALCULUS AB

1) For

$$f(x) = \frac{x^3 + 2x^2 - 11x - 12}{x^2 + x - 2}, = \frac{p(x)}{q(x)}$$

- Calculate the end-behavior function $E(x)$.
Use long division.
- Find the vertical asymptotes of $y = f(x)$.
- Graph $y = f(x)$, $y = E(x)$ and the vertical asymptotes on the grid provided.



(a)

$$\begin{array}{r} x+1 \\ x^2+x-2 \overline{) x^3+2x^2-11x-12} \\ \underline{-x^3-x^2+2x} \\ x^2-9x-12 \\ \underline{-x^2-x+2} \\ -10x-10 \end{array}$$

$$f(x) = x+1 + \frac{-10x-10}{x^2+x-2} \Rightarrow$$

$$E(x) = x+1 \leftarrow$$

$$(b) f(x) = \frac{p(x)}{(x-1)(x+2)}$$

$$p(1) = -20 \quad p(-2) = 10 \Rightarrow$$

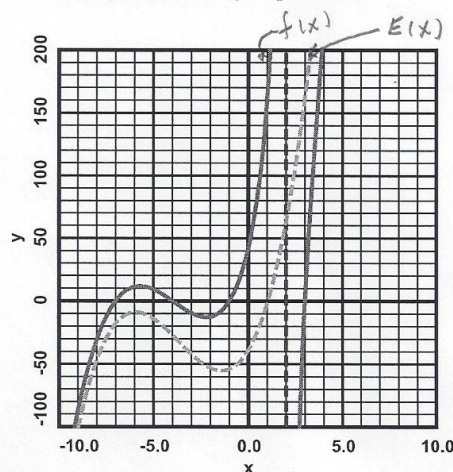
$$x=1 \text{ \& } x=-2 \text{ are V.A.s } \leftarrow$$

END - BEHAVIOR FUNCTIONS OF RATIONAL FUNCTIONS

2) For

$$f(x) = \frac{x^4 + 9x^3 + 3x^2 - 89x - 84}{x-2}, = \frac{p(x)}{q(x)}$$

- Calculate the end-behavior function $E(x)$.
Use synthetic division.
- Find the vertical asymptote of $y = f(x)$.
- Graph $y = f(x)$, $y = E(x)$ and the vertical asymptote on the grid provided.



(a)

$$\begin{array}{r|rrrrr} 2 & 1 & 9 & 3 & -89 & -84 \\ & & 2 & 22 & 50 & -78 \\ \hline & 1 & 11 & 25 & -39 & -162 \end{array}$$

$$f(x) = x^3 + 11x^2 + 25x - 39 - \frac{162}{x-2}$$

$$\Rightarrow E(x) = x^3 + 11x^2 + 25x - 39 \leftarrow$$

$$(b) p(2) = -162 \Rightarrow$$

$$x=2 \text{ is V.A. } \leftarrow$$