

- When asked to find horizontal asymptotes, you have to clearly compute:

$$\left. \begin{array}{l} \bullet \lim_{x \rightarrow \infty} f(x) \\ \bullet \lim_{x \rightarrow -\infty} f(x) \end{array} \right\} \text{ to get full credit.}$$

eg Find the h.a. of  $f(x) = \frac{x^2+5}{x^3+4}$

$$\text{Soln: } \lim_{x \rightarrow \infty} \frac{x^2+5}{x^3+4} = \lim_{x \rightarrow \infty} \frac{\frac{x^2}{x^3} + \frac{5}{x^3}}{\frac{x^3}{x^3} + \frac{4}{x^3}} = \lim_{x \rightarrow \infty} \frac{\frac{1}{x} + \frac{5}{x^3}}{1 + \frac{4}{x^3}} = 0.$$

$$\bullet \lim_{x \rightarrow -\infty} \frac{x^2+5}{x^3+4} = \lim_{x \rightarrow -\infty} \frac{\frac{1}{x} + \frac{5}{x^3}}{1 + \frac{4}{x^3}} = 0.$$

So,  $y=0$  is the only h.a.