

- 1) Explain in your own words and diagrams what  $\lim_{x \rightarrow \infty} f(x)$  means. How does this differ from when we say that a limit is unbounded?

- 2) What is relationship between limits and asymptotes (horizontal and/or vertical)?

- 3) Design a methodology to compute the horizontal asymptotes and vertical asymptotes of functions. Test your methodology with the following functions:

a)

$$f(x) = \frac{2x^2 + 5}{x^2 - 5x}$$

b)

$$g(x) = \frac{\sqrt[3]{x} - 4x + 7}{3x + x^{2/3} - 1}$$

c)

$$h(x) = \sqrt{x^2 + x} - \sqrt{x^2 - 2x}$$

d)

$$\ell(x) = \frac{1}{x \sin x}$$