MATA 31 Calculus 1 winter 2024

Problem Set 1

Jan 28 - Feb 4 on Crowdmark

Each question is 25 points.

1. (25) Consider the sequence

$$(a_1, a_2, a_3, \cdots, a_n, \cdots) = (\frac{1}{2}, \frac{1}{8}, \frac{1}{32}, \cdots, \frac{1}{2^{2n-1}}, \cdots)$$

Find the limit L of this sequence. Find the smallest number $N \in \mathbf{N}$ so that for all $n \geq N$ we have that $|a_n - L| < 0.01$

2. (25)

   (a) (15) Sketch the graph of the function

$$f(x) = \frac{(x-4)^2 x(x+2)}{x^2(x-4)(x-5)}$$

   Make sure that you identify all horizontal and vertical asymptotes, and all intersection points.