Using limits to detect asymptotes

After completing this section, students should be able to do the following.

- Recognize when a limit is indicating there is a vertical asymptote.
- Evaluate the limit as x approaches a point where there is a vertical asymptote.
- Match graphs of functions with their equations based on vertical asymptotes.
- Discuss what it means for a limit to equal ∞.
- Define a vertical asymptote.
- Find horizontal asymptotes using limits.
- Produce a function with given asymptotic behavior.
- Recognize that a curve can cross a horizontal asymptote.
- Understand the relationship between limits and vertical asymptotes.
- Calculate the limit as x approaches $\pm\infty$ of common functions algebraically.
- Find the limit as x approaches $\pm\infty$ from a graph.
- Define a horizontal asymptote.
- Define a slant asymptote.
- Approximate a slant asymptote from the graph of a function.
- Find slant asymptotes algebraically and graphically.
- Compute limits at infinity of famous functions.
- Find vertical asymptotes of famous functions.
- Identify horizontal asymptotes by looking at a graph.
- Identify vertical asymptotes by looking at a graph.
- Identify slant asymptotes by looking at a graph.

Learning outcomes: