Section 1.5

Definition: A limit in which a function $f(x)$ increases or decreases without bound as x approaches c is called an **infinite limit**.

1) For the following functions, find the real number c that is not in the domain of the function. Then graph the function on your calculator and find the limits as x approaches c from the left and from the right.

   a) $f(x) = \dfrac{5}{x-2}$

   b) $g(x) = \dfrac{x}{(5-x)^2}$

Definition: If $f(x)$ approaches infinity (or negative infinity) as x approaches c from the right or the left, then the line $x = c$ is a **vertical asymptote** of the graph.

2) Determine all the vertical asymptotes of the graph of each function.

   a) $f(x) = \dfrac{5}{3x-5}$

   b) $g(x) = \dfrac{2x-1}{8x^2-18x+4}$

   c) $h(x) = \csc x$

3) Determine all vertical asymptotes of the graph of $f(x) = \frac{3x+2}{6x^2-17x-14}$.

4) Determine the following limits.

a) $\lim_{x \to -1^+} \frac{3x^2+1}{\tan\left(\frac{\pi}{2}x\right)}$

b) $\lim_{x \to 0^-} 10 \csc^2 x$

Homework for this section: Read the section and watch the videos/tutorials. Then do these problems in preparation for the quiz: #5, 19, 21, 22, 25, 29, 37