1. Consider the function
$$f(x) = \frac{18 - 2^x}{\sqrt{x^2+1} - \sqrt{17}}.$$
   (a) Use the graph of f to approximate the left-hand limits, right-hand limits, and limits at -4 and at 4. Make sure that the six limits are clearly stated in complete sentences.
   (b) Find the same six limits as above, but do so numerically via matrix tables. Make sure that the estimated six limits are clearly stated in complete sentences.
   (c) Find the same six limits as above, but do so symbolically rather than graphically or numerically. Further, determine the value of the function at -4 and 4.
   (d) If any discrepancies occurred in or between (a), (b), or (c), identify them and explain why you think they occurred.
   (e) Does the function have any horizontal asymptotes? Justify.

2. Determine, if possible, the left-hand limit, right-hand limit, and limit for
$$g(x) = \begin{cases} \dfrac{\cot 2x}{5x} & \text{if } x < 0 \\ (1+2x)^{\frac{1}{5x}} & \text{if } x \geq 0 \end{cases}$$
at 0. Evaluate g at 0. Also, determine the limit of the function g as x grows without bound to the left and right. *Are your solutions consistent with the graph of the function?*

3. Evaluate each limit, if possible. Use the same variable as given. Note: You should be looking at your answers to make sure that they are reasonable. If a solution is not reasonable, make sure that you have typed in the function correctly.
   (a) $\displaystyle\lim_{t\to\infty} \frac{5t+7}{\sqrt{4t^2-3}}$
   (b) $\displaystyle\lim_{t\to-\infty} \frac{5t+7}{\sqrt{4t^2-3}}$
   (c) $\displaystyle\lim_{\varphi\to\frac{\pi}{2}} (\tan\varphi)^{\cot\varphi}$
   (d) $\displaystyle\lim_{x\to 0^+} (1-5x)^{\csc x}$
   (e) $\displaystyle\lim_{\theta\to\frac{\pi}{2}} \frac{2-\cos\theta}{5\sin^3\theta}$
   (f) $\displaystyle\lim_{x\to 0^-} \left(\frac{1}{\sqrt{1-2x^2}} - \frac{1}{x}\right)$
   (g) $\displaystyle\lim_{t\to 0^+} \left(\sec(t) - \frac{1}{t}\right)$
   (h) $\displaystyle\lim_{\theta\to\frac{\pi}{2}^-} \left(\tan^2\theta - \sec^2\theta\right)$