1. The height of a rock thrown upwards in the moon is given by \( h = 1.66t - 0.83t^2 \). Find the average velocity:
   a) In the interval \([1, 2]\).
   b) In the interval \([1, 1.01]\).

   Ans: 
   Ans:

2. Guess the limit. Show a table or a graph as appropriate.
   a) \( \lim_{x \to 0} \frac{\sin x - x}{x^3} \). (Numerically)
   b) \( \lim_{x \to 0} \frac{5x}{\sin 3x} \). (Graphically)

   Ans: 
   Ans:

3. Determine the infinite limit by any method:
   a) \( \lim_{x \to 1^+} \frac{1}{x^3 - 1} \).
   b) \( \lim_{x \to \infty} \frac{100x^2 - 1}{4x^3 - 1} \).

   Ans: 
   Ans:

4. Evaluate the limit and justify every step using the Limit Law(s).
   a) \( \lim_{x \to 1} 3x(2x - 1)^2 \).
   b) \( \lim_{x \to 4} \sqrt{16 - x^2} \).

   Ans: 
   Ans:

5. Evaluate the limit analytically, if it exists:
   a) \( \lim_{x \to 4} \frac{x^2 - 4x}{x^2 - 3x - 4} \).
   b) \( \lim_{x \to 2} \frac{x^3 - 8}{x - 2} \).

   Ans: 
   Ans:
6. Using the \( \epsilon, \delta \) definition, prove rigorously that: \( \lim_{x \to 1} (2 - 5x) = -3 \).

8. Explain why the following functions are discontinuous at \( x = 2 \).
   a) \( f(x) = \frac{x^2 - 4}{x - 2} \).
   b) \( f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & x \neq 2 \\ 2 & x = 2 \end{cases} \)

8. Use a limit method to find the rate of change of \( f(x) \) at the point \( x = 5 \).
   \( f(x) = \sqrt{x - 1} \)

Ans: ________________________.

9. The table below shows the price of gas in dollars for a period of 8 months:

\[
\begin{array}{c|cccccccc}
  t & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\
p & 1.89 & 1.98 & 2.12 & 2.24 & 2.45 & 2.73 & 2.94 & 3.12 \\
\end{array}
\]
   a) What is the average increase in the first 4 months?
   b) Estimate the rate of increase in the 6th month.

Ans: ________________________.

Ans: ________________________.

10. Use the limit definition to find the derivative of \( f(x) = \frac{3}{x + 2} \)

Ans: ________________________.

Extra space.