Lab Worksheet for November 30 , 2021

Practice with the Intermediate Value Theorem and past topics.

1.) Let g be a continuous function on the closed interval [-1,5]. A few values of g are given in this table:

x	-1	2	4	5
g(x)	0	4	9	15

What interval(s) must contain a solution to g(x) = 3?

2.) Let h be a continuous function on the closed interval [1,6]. A few values of h are given in this table:

x	1	3	4	6
h(x)	-5	-2	2	-5

What interval(s) must contain a solution to h(x) = 0?

3.) A continuous function f satisfies the following properties:

a) $\lim_{x \to \infty} f(x) = 5.$

b) $\lim_{x \to -\infty} f(x) = 2$.

c) f is not defined at 3.

d) $\lim_{x \to 3^+} f(x) = \infty$.

e) $\lim_{x \to 3^-} f(x) = -\infty$.

f) f''(x) is negative when x < 3.

g) f''(x) is positive when x > 3.

Sketch the graph.

4.) Sketch the graph of the following function.

$f(x) = \frac{x-1}{x^2-9}$

5.) Evaluate each limit.

a) $\lim_{x \to 2} \frac{x^3-8}{x^2-4}$

b) $\lim_{x \to 0} \frac{\sin(5x)}{x}$

c) $\lim_{x \to 2} \frac{x^2-4x+4}{x^3-12x+16}$

d) $\lim_{x \to \infty} e^x$

e) $\lim_{x \to -3^-} \frac{x-1}{x^2-9}$

f) $\lim_{x \to -3^+} \frac{x-1}{x^2-9}$

g) $\lim\limits_{x \to -3} \dfrac{x-1}{x^2-9}$