QUIZ 1

Please show ALL of your work to receive full credit on each problem.

Problem 1. (12 points) Consider the function

$$g(x) = -2 - \sqrt{x}.$$

(a) (2 pts) Which essential/standard function f is the function g a transformation of?

(b) (4 pts) List all of the transformations of the function f you stated in part (a) that you can identify in the function g.

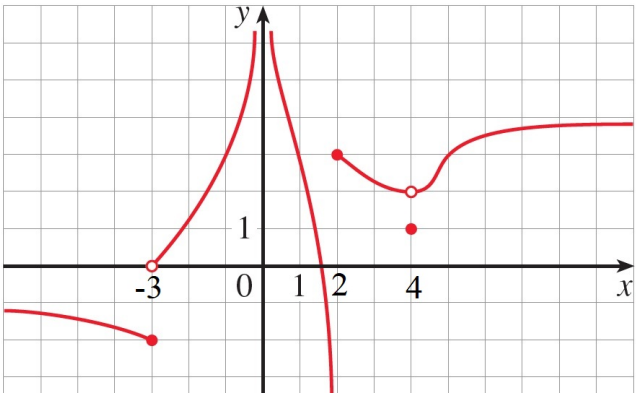
(c) (2 pts) Sketch a graph of the essential/standard function f you stated in part (a).

(d) (4 pts) Sketch a graph of the function g by hand, **not by plotting points**, but by using the graph of f and applying the transformations you listed in part (c).

Problem 2. (12 points) Sketch the graph of a function that satisfies all of the given conditions below.

$$\lim_{x\to -3^-} f(x) = 3, \quad \lim_{x\to -3^+} f(x) = 2, \quad \lim_{x\to 3^-} f(x) = -1, \quad \lim_{x\to 3^+} f(x) = 2, \quad f(-3) = 2, \quad f(3) = 0.$$

Problem 3. (18 points) The graph of a function f is given below. Find each of the limits (worth 2 points each), or explain why they do not exist.



(a) $\lim_{x\to -3^+} f(x)$ (b) $\lim_{x\to -3^-} f(x)$ (c) $\lim_{x\to -3} f(x)$ (d) $\lim_{x\to 4^+} f(x)$ (e) $\lim_{x\to 4^-} f(x)$ (f) $\lim_{x\to 4} f(x)$

(g) $\lim_{x\to 2^+} f(x)$ (h) $\lim_{x\to 2^-} f(x)$ (i) $\lim_{x\to 2} f(x)$

Problem 4. (8 points) Evaluate the following two limits, if they exist. If you can obtain your answer satisfies

$$\lim_{x\to a} f(x) = f(a),$$

PLEASE EXPLAIN WHY. If an answer does not exist, write DNE.

(a) (4 pts) $\lim_{x\to 5} 4x^2 - 5x$ (b) (4 pts) $\lim_{t\to 6} \dfrac{t^2 - 2t - 24}{t - 6}$