

QUIZ 1 - MAKE UP

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

Problem 1. (10 points) Consider the function

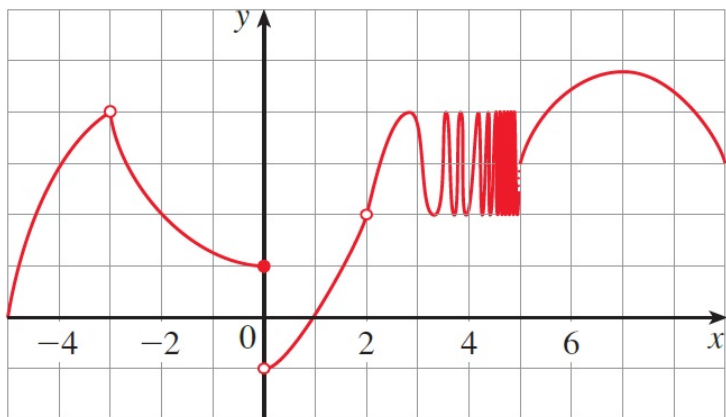
$$g(\theta) = 2 \cos\left(\frac{\theta}{2}\right).$$

- (a) (1 pts) Which essential/standard function f is the function g a transformation of?
- (b) (3 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.

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

Problem 3. (20 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) $\lim_{x \rightarrow -3} f(x)$
- (b) $\lim_{x \rightarrow 0^-} f(x)$
- (c) $\lim_{x \rightarrow 0^+} f(x)$
- (d) $\lim_{x \rightarrow 0} f(x)$
- (e) $\lim_{x \rightarrow 2^-} f(x)$
- (f) $\lim_{x \rightarrow 2^+} f(x)$
- (g) $\lim_{x \rightarrow 2} f(x)$
- (h) $\lim_{x \rightarrow 5^-} f(x)$
- (i) $\lim_{x \rightarrow 5^+} f(x)$
- (j) $\lim_{x \rightarrow 5} f(x)$

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

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

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

- (a) (4 pts) $\lim_{x \rightarrow 3} 3x^3 - 2x + 1$
- (b) (4 pts) $\lim_{\theta \rightarrow \frac{\pi}{2}} \frac{\cos(\theta)}{\theta - \pi}$