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QUIZ 3

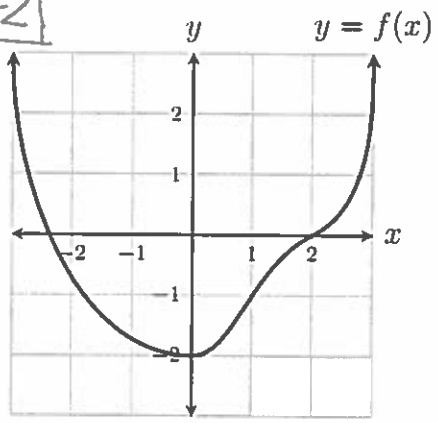
MATH 200, SECTION 1

February 12, 2021

Directions: Closed book, closed notes, no calculators. Each problem is 10 points, for a total of 20 points.

By submitting this quiz you affirm that you agree with this statement: *On my honor, I have neither given nor received unauthorized aid on this assignment, and I pledge that I am in compliance with the VCU Honor System.*

1. Answer the following questions involving the two functions graphed below.



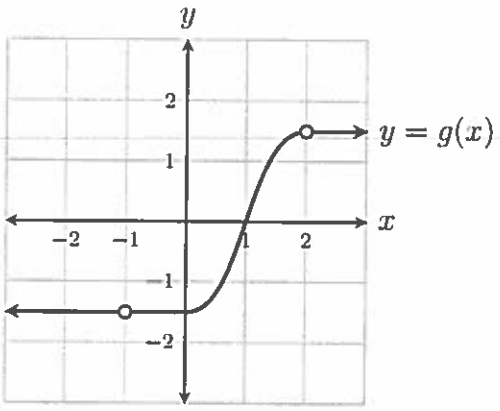
(a) $\lim_{x\to 1} f(g(x)) = f\left(\lim_{x\to 1} g(x)\right) = f(0) = \boxed{-2}$

(b) $\lim_{x\to 1} f(x)g(x) = \lim_{x\to 1} f(x) \lim_{x\to 1} g(x)$

$= (-1)\cdot 0 = \boxed{0}$

(c) $\lim_{x\to 1} \cos\left(f(x)g(x)\right) = \cos\left(\lim_{x\to 1} f(x)g(x)\right)$

$= \cos(0) = \boxed{1}$



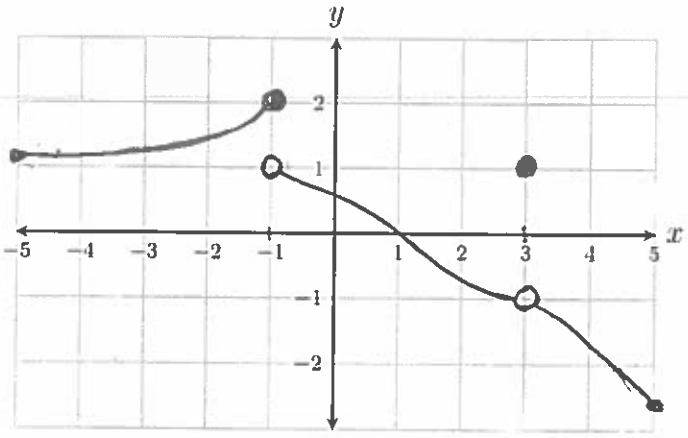
(d) $\lim_{x\to 2} \dfrac{\sin(f(x))}{\pi f(x)} = \dfrac{1}{\pi} \lim_{x\to 2} \dfrac{\sin(f(x))}{f(x)}$

$= \dfrac{1}{\pi}\cdot 1 = \boxed{\dfrac{1}{\pi}}$

(e) At which x (if any) is $g(x)$ discontinuous?

$\boxed{x = -1 \text{ and } x = 2}$

2. Sketch the graph of **one** function f that meets **all** of the following criteria.



(a) The domain of f is the interval $[-5, 5]$.

(b) f is continuous at all x in $[-5, 5]$ **except** at $x = -1$ and $x = 3$.

(c) $\lim_{x\to -1^+} f(x) = 1$

(d) $\lim_{x\to -1^-} f(x) = 2$

(e) $\lim_{x\to 3} f(x) = -1$