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QUIZ 3

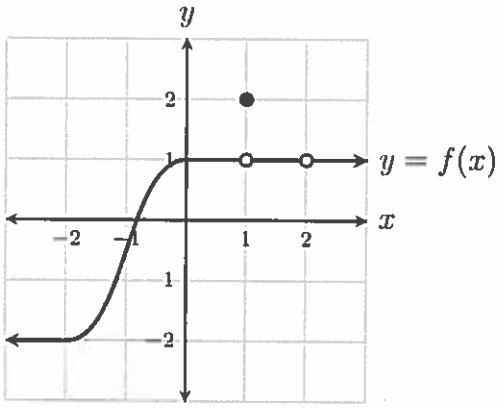
MATH 200, SECTION 9

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) At which x (if any) is $f(x)$ discontinuous?

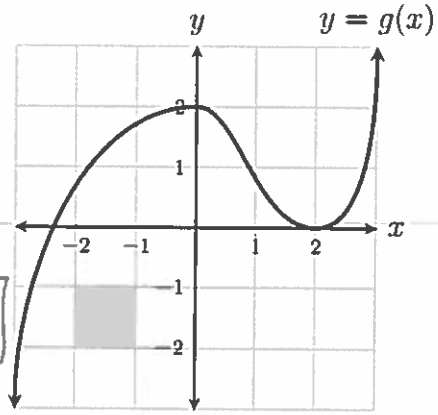
$x = 1$ and $x = 2$

(b) $\lim_{x\to 2} f(g(x)) = f\left(\lim_{x\to 2} g(x)\right)$

$= f(0) = 1$

(c) $\lim_{x\to 2} f(x)g(x) = \lim_{x\to 2} f(x) \cdot \lim_{x\to 2} g(x)$

$= 1 \cdot 0 = 0$



(d) $\lim_{x\to 0} \sin\left(\frac{3\pi f(x)}{g(x)}\right) = \sin\left(\lim_{x\to 0} \frac{3\pi f(x)}{g(x)}\right)$

$= \sin\left(\frac{3\pi \cdot 1}{2}\right) = \sin\left(\frac{3\pi}{2}\right) = -1$

(e) $\lim_{x\to -1} \frac{\sin(f(x))}{f(x)} = 1$ (because $f(x) \to 0$ as $x \to -1$)

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

(d) $\lim_{x\to 3^-} f(x) = -2$

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