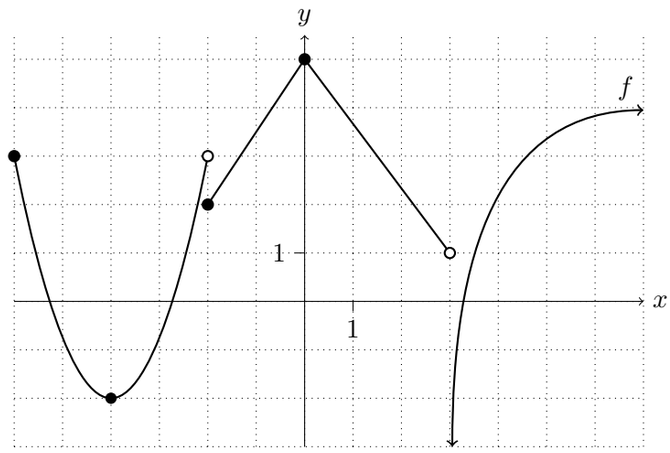
Math 108-01
Summer 2024
Dr. Lily Yen
Lisa Lajeunesse

Quiz Four

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ___/10

Problem 1: The graph of $y = f(x)$ is shown. Use the graph to answer the questions. Use the symbols ∞, $-\infty$, and DNE where appropriate.



a. $f(0) =$ 5

b. $\lim_{x\to 0^+} \dfrac{f(x)-5}{x} =$ $-4/3$

c. $\lim_{x\to 0} \dfrac{f(x)-5}{x} =$ DNE

d. $\lim_{x\to -2^-} \dfrac{f(x)-f(-2)}{x+2} =$ $-\infty$

e. $\lim_{h\to 0} \dfrac{f(-1+h)-f(-1)}{h} =$ $3/2$

Score: /5

Problem 2: Use the limit definition of the derivative to find the derivative of $f(x) = \dfrac{1}{x+2}$ at $x = 3$.

$$f'(3) = \lim_{h\to 0} \frac{f(3+h)-f(3)}{h} = \lim_{h\to 0} \frac{\frac{1}{5+h}-\frac{1}{5}}{h} = \lim_{h\to 0} \frac{\frac{5}{5(5+h)}-\frac{5+h}{5(5+h)}}{h}$$

$$= \lim_{h\to 0} \frac{\frac{-h}{5(5+h)}}{h} = \lim_{h\to 0} \frac{-1}{5(5+h)} = \frac{-1}{25}$$

Score: /5