Math 108
Spring 2024
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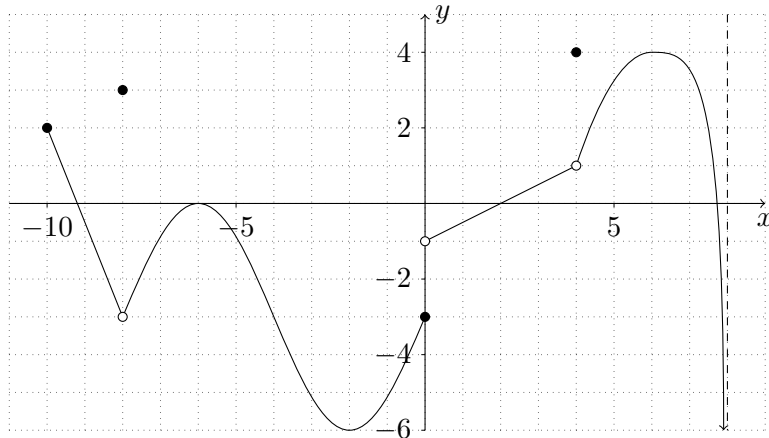
Quiz 3

Show all your work

Name: _____

Number: _____

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Score: ___/10

Problem 1: Shown is the graph of $y = f(x)$. Answer the following questions.

a. $f'(1) =$

$$\boxed{1/2}$$

b. $\lim\limits_{x \to 2.8182} \dfrac{f(x) - f(2.8182)}{x - 2.8182} =$

$$\boxed{1/2}$$

c. $\lim\limits_{x \to 6} \dfrac{f(x) - f(6)}{x - 6} =$

$$\boxed{0}$$

d. $\lim\limits_{h \to 0^-} \dfrac{f(-8 + h) - f(-8)}{h} =$

$$\boxed{\infty}$$

e. $\lim\limits_{x \to 0} \dfrac{f(x) - f(0)}{x} =$

$$\boxed{DNE}$$

f. State all value(s) of x in the domain where f is discontinuous.

$$\boxed{-8, \ 0, \ 4}$$

Score: ___/6

Problem 2: Find the derivatives of the following functions.

a. $f(x) = (x^2 + 3)(5 - x^5)$

$$f'(x) = 2x(5 - x^5) + (x^2 + 3)(-5x^4) = -7x^6 - 15x^4 + 10x$$

b. $g(x) = \dfrac{\pi x^3 - 4}{7x + 1}$

$$g'(x) = \frac{3\pi x^2(7x + 1) - (\pi x^3 - 4)7}{(7x + 1)^2} = \frac{14\pi x^3 + 3\pi x^2 + 28}{(7x + 1)^2}$$

Score: ___/4