

Name: _____

Section: _____

12

You have ~~12~~ minutes to complete the quiz. Please **show all work**, and then **write your answer on the line provided**.

1. Let $f(x) = x^2 + x + 1$. Find the slope of the secant which intersects the graph at the points with $x = 0$ and with $x = 1$.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{f(1) - f(0)}{1 - 0}$$

$$\begin{aligned} f(0) &= 0^2 + 0 + 1 = 1 \\ f(1) &= 1^2 + 1 + 1 = 3 \end{aligned}$$

$$= \frac{3 - 1}{1} = \frac{2}{1} = 2$$

Answer: Slope = 2 } 1pt

2. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = \lim_{x \rightarrow 1} \frac{(x+1)(x-1)}{(x-1)} = \lim_{x \rightarrow 1} (x+1)$$

not defined at 1
 \Rightarrow not continuous
 \Rightarrow cannot plug in 1

1 pt

$$= 1 + 1 = 2$$

Answer: 2 ← 1pt

3. Evaluate the following limit:

$$\lim_{x \rightarrow -3} \frac{4x}{x + 9} = \frac{4(-3)}{(-3) + 9} = \frac{-12}{6} = -2$$

\Rightarrow defined at $x = -3$
 \bullet AND is rational
 \Rightarrow is continuous
 \Rightarrow can just plug in -3

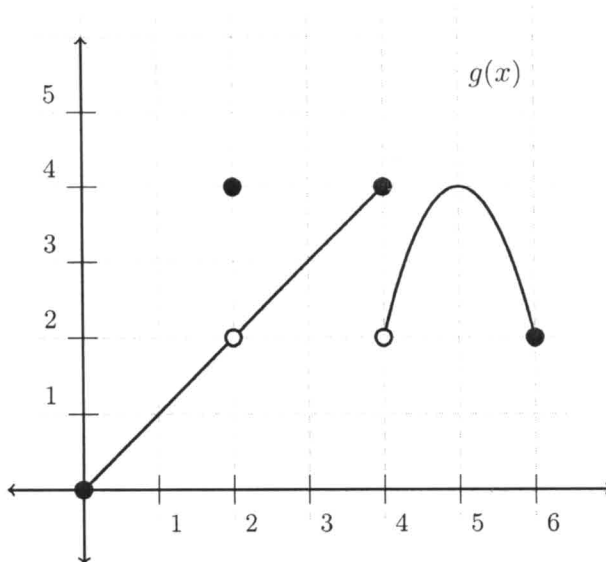
1 pt

Answer: -2 ← 1pt

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4. (4 points) The graph of a function g is given below.



(a) Find the numbers at which $g(x)$ is discontinuous, and state the type of discontinuity:

Not continuous at

$\frac{1}{2}$ pt $\rightarrow x=2$ \leftarrow removable discontinuity $\frac{1}{2}$ pt

$\frac{1}{2}$ pt $\rightarrow x=4$ \leftarrow jump discontinuity $\frac{1}{2}$ pt

(b) ^{each found} For point in (b), is it continuous from the right, or from the left, or neither?

$(\frac{1}{2}$ each) $\frac{1}{2}$ pt \rightarrow at $x=2$, f is not continuous from either right or left

1 pt \rightarrow at $x=2$, f is continuous from the left $\frac{1}{2}$ pt
but not the right. $\frac{1}{2}$ pt