Unit 1 Quiz 2 Review

Name: _____ **Date:** _____

1. $\lim_{x\to 0} \dfrac{\sin x \cos x}{x}$ is

2. $\lim_{x\to 0} \dfrac{\sin 4x}{2x}$ is

3. $\lim_{x\to 0} \dfrac{\sin 9x}{\sin 5x} =$

4. $\lim_{x\to 7^-} \dfrac{|x-7|}{x-7} =$

5. $\lim_{x\to 2^+} \dfrac{x\,|x-2|}{x-2}$ is

6. $\lim_{x\to 4^-} \dfrac{2-\sqrt{x}}{\sqrt{4-x}}$ is

7. Let f be defined as follows:

$$f(x) = \begin{cases} \dfrac{x^2-9}{x-3} & \text{for } x \neq 3, \\ 1 & \text{for } x = 3 \end{cases}$$

Which of the following are true about f?

I. $\lim_{x\to 3} f(x)$ exists

II. $f(3)$ exists

III. $f(x)$ is continuous at $x = 3$

8. Let f be defined as following:

$$f(x) = \begin{cases} x^2-4 & \text{for } x > 6, \\ 2ax & \text{for } x \leq 6 \end{cases}$$

For what value of a is the function continuous?

9. $f(x) = \begin{cases} x^2-45 & \text{for } x > 9, \\ a^2x & \text{for } x \leq 9 \end{cases}$

For what value(s) of a is the function continuous?

10. Consider $f(x) = \begin{cases} x^2 + 2 & \text{for } x < 0, \\ 1 & \text{for } x = 0, \\ x^2 - 2 & \text{for } x > 0 \end{cases}$

a) $\lim_{x \to 0^+} f(x) =$ _____

b) $\lim_{x \to 0^-} f(x) =$ _____

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

d) Where is $f(x)$ discontinuous?

e) If a function is discontinuous at $x = a$, does this necessarily mean that $\lim_{x \to a}$ does not exist?

11. $\lim_{h \to 0} \dfrac{7(x+h)^2 - 7x^2}{h} =$

12. $\lim_{h \to 0} \dfrac{\sqrt{x+h} - \sqrt{x}}{h} =$

13. $\lim_{h \to 0} \dfrac{\frac{1}{(x+h)^2} - \frac{1}{x^2}}{h} =$

14. $\lim_{x \to \frac{1}{2}} \dfrac{8x^3 - 1}{10x^2 - 7x + 1} =$

15. Find A so that $\lim_{x \to 2} \dfrac{x^2 + Ax - 10}{x - 2}$ exists.

16. If $\lim_{x \to 0} \dfrac{\sqrt{Ax + B} - 2}{x} = 3$, then what are the values of A and B?

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1.
Answer: 1
Points: 1

2.
Answer: 2
Points: 1

3.
Answer: $\frac{9}{5}$
Points: 1

4.
Answer: -1
Points: 1

5.
Answer: 2
Points: 1

6.
Answer: 0
Points: 1

7.
Answer: I and II only
Points: 1

8.
Answer: 3
Points: 1

9.
Answer: ± 2
Points: 1

10.
Answer: -2, 2, 2, at 0, no
Points: 1

11.
Answer: $14x$
Points: 1

12.
Answer: $\frac{1}{2\sqrt{x}}$
Points: 1

13.
Answer: $-\frac{2}{x^3}$
Points: 1

14.
Answer: 2
Points: 1

15.
Answer: 3
Points: 1

16.
Answer: $A = 12, B = 4$
Points: 1