AP Calculus AB Name_____

Continuous or No?

Date_____

Determine if each function is continuous. If the function is not continuous, find the *x*-axis location of and classify each discontinuity.

1) $f(x) = \dfrac{25}{x^2 + 5}$

2) $f(x) = \dfrac{x^2}{2x + 4}$

3) $f(x) = \begin{cases} -x^2 - 4x - 3, & x < -1 \\ -\dfrac{x}{2} - \dfrac{1}{2}, & x \geq -1 \end{cases}$

4) $f(x) = \dfrac{x^2 - 3x + 2}{x - 2}$

5) $f(x) = \dfrac{x^2 - 4}{x + 2}$

6) $f(x) = \dfrac{x^2 - 3x}{x - 3}$

7) $f(x) = \begin{cases} -x - 5, & x \leq 1 \\ -3, & x > 1 \end{cases}$

8) $f(x) = \dfrac{x^2}{3x - 9}$

9) $f(x) = \dfrac{x + 7}{x^2 - 2x - 3}$

10) $f(x) = \begin{cases} -2x, & x \neq -1 \\ 4, & x = -1 \end{cases}$

11) $f(x) = \dfrac{9x}{x^2 + 9}$

12) $f(x) = \begin{cases} -x^2 - 4x - 3, & x < 0 \\ -\dfrac{x}{2} - \dfrac{3}{2}, & x \geq 0 \end{cases}$

13) $f(x) = \begin{cases} 1 + \dfrac{x}{2}, & x \neq 2 \\ 2, & x = 2 \end{cases}$

14) $f(x) = -\dfrac{25x}{x^2 + 25}$

15) $f(x) = -\dfrac{x^2 + 2x - 3}{x + 3}$

16) $f(x) = \begin{cases} -\dfrac{x}{2} + \dfrac{3}{2}, & x < 3 \\ -2x + 6, & x \geq 3 \end{cases}$

17) $f(x) = -\dfrac{x^2}{x + 1}$

18) $f(x) = \begin{cases} -x, & x < -2 \\ -2x - 3, & x \geq -2 \end{cases}$

19) $f(x) = \begin{cases} -x^2 + 2x, & x \neq 2 \\ -3, & x = 2 \end{cases}$

20) $f(x) = \sin x;\ [-\pi, \pi]$