

1.3b Continuity Conditions Practice Worksheet with Piecewise Functions

Use the definition of continuity to determine whether f is continuous at a . Determine type of discontinuity if function is not continuous at a

$$13. f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & \text{if } x \neq 2 \\ 5 & \text{if } x = 2 \end{cases}$$

$a = 2$

$$16. f(x) = \begin{cases} x - 4 & \text{if } x \leq 0 \\ x^2 + x - 4 & \text{if } x > 0 \end{cases}$$

$a = 0$

$$18. f(x) = \begin{cases} 2 - x & \text{if } x < 1 \\ 1 & \text{if } x = 1 \\ x^2 & \text{if } x > 1 \end{cases}$$

$a = 1$

Continuity Conditions

i. $f(c)$ is defined

ii. $\lim_{x \rightarrow c} f(x)$ exists
($\lim_{x \rightarrow c^-} f(x) = \lim_{x \rightarrow c^+} f(x)$)

iii. $\lim_{x \rightarrow c} f(x) = f(c)$

Find the value of “a” and/or “b” for which the function is continuous.

$$4) f(x) = \begin{cases} 7x - 2 & \text{if } x \leq 1 \\ ax^2 & \text{if } x > 1 \end{cases}$$

$$5) f(x) = \begin{cases} ax^2 & \text{if } x \leq 2 \\ 2x + a & \text{if } x > 2 \end{cases}$$

$$6. h(x) = \begin{cases} x^3; x \leq 2 \\ ax^2; x > 2 \end{cases}$$

$$7. g(x) = \begin{cases} \frac{x^2+3x+2}{x+1}; x \neq -1 \\ a; x = -1 \end{cases}$$