

Answer on Question #65555 - Math - Calculus

Question 65555:

What value assigned to $f(x)$ at $x = 2$ will make the function f defined by $f(x) = (x^2 + x - 6)/(x^2 - 4)$ continuous?

Solution:

Note that the function $f(x)$ is undefined and therefore not continuous at $x = 2$. To determine if this discontinuity is removable, we need to find the limit of the function as x approaches 2:

$$\lim_{x \rightarrow 2} f(x) = \lim_{x \rightarrow 2} f(x) = \lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{(x - 2)(x + 3)}{(x - 2)(x + 2)} = \lim_{x \rightarrow 2} \frac{(x + 3)}{(x + 2)} = \frac{\lim_{x \rightarrow 2} (x + 3)}{\lim_{x \rightarrow 2} (x + 2)} = \frac{5}{4}$$

So, the discontinuity can be removed by assigning the value $5/4$ to $f(x)$ at $x = 2$.

Answer:

$5/4$.

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