

6. Sketch the graph of a function that has a jump discontinuity at $x=2$ and a removable discontinuity at $x=4$, but is continuous elsewhere.

12. USE the definition of continuity and the properties of limits to show that the function is continuous at the given number.

$$g(x) = \frac{x+1}{2x^2-1}, \quad a=4$$

20 Explain why the function is discontinuous at the given number a . Sketch the graph of the function.

$$f(x) = \begin{cases} 1+x^2 & \text{if } x < 1 \\ 4-x & \text{if } x \geq 1 \end{cases} \quad a=1$$

36. Find the numbers at which f is discontinuous. At which of these numbers is f continuous from the right, from the left, or neither? Sketch the graph of f .

$$f(x) = \begin{cases} x+1 & \text{if } x \leq 1 \\ 1/x & \text{if } 1 < x < 3 \\ \sqrt{x-3} & \text{if } x \geq 3 \end{cases}$$

46. Use the Intermediate Value Theorem to show that there is a root of the given equation in the specified interval.

$$\sqrt[3]{x} = 1-x, \quad (0, 1)$$