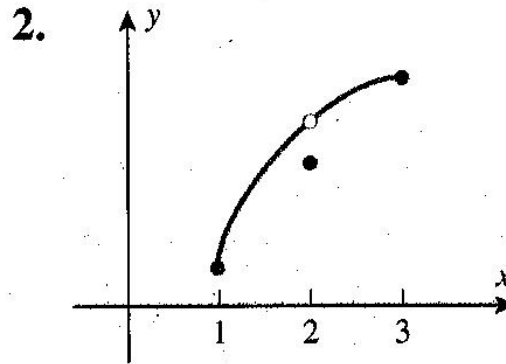
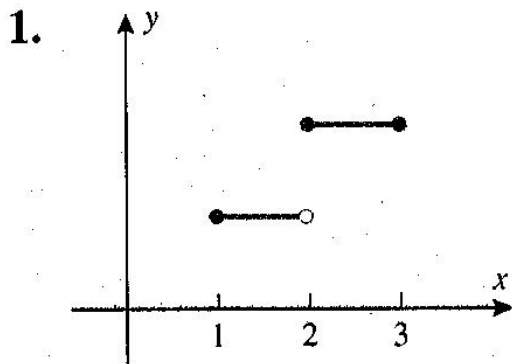


Continuity Homework

For problems 1-2, let f be the function whose graph is shown. On which of the following intervals, if any, is f continuous?

- a) $[1, 3]$ b) $(1, 3)$ c) $[1, 2]$ d) $(1, 2)$ e) $[2, 3]$ f) $(2, 3)$



- 3) For the graph in problem 1, is f continuous from the right at $x = 2$?
- 4) For the graph in problem 1, is f continuous from the left at $x = 2$?
- 5) For the graph in problem 1, is f continuous from the right at $x = 3$?
- 6) For the graph in problem 1, is f continuous from the left at $x = 3$?

For problems 7-10, determine whether f is continuous at the given value. If not, explain why the function is discontinuous.

7) $f(x) = \ln(x+1)$ at $x = -1$

8) $f(x) = \begin{cases} 2x-1 & \text{if } x < 0 \\ 3x+1 & \text{if } x \geq 0 \end{cases}$ at $x = 0$

9) $f(x) = \begin{cases} \frac{x^2-1}{x+1} & \text{if } x \neq -1 \\ 6 & \text{if } x = -1 \end{cases}$ at $x = -1$

10) $f(x) = \begin{cases} 2x-1 & \text{if } x < 0 \\ 3x-1 & \text{if } x \geq 0 \end{cases}$

Answers:

- 1) d, e, f
- 2) d, f
- 3) yes
- 4) no
- 5) no
- 6) yes
- 7) It is discontinuous because $f(-1)$ is not defined
- 8) It is discontinuous because $\lim_{x \rightarrow 0} f(x)$ d.n.e.
- 9) It is discontinuous because $\lim_{x \rightarrow -1} f(x) \neq f(-1)$
- 10) It is continuous