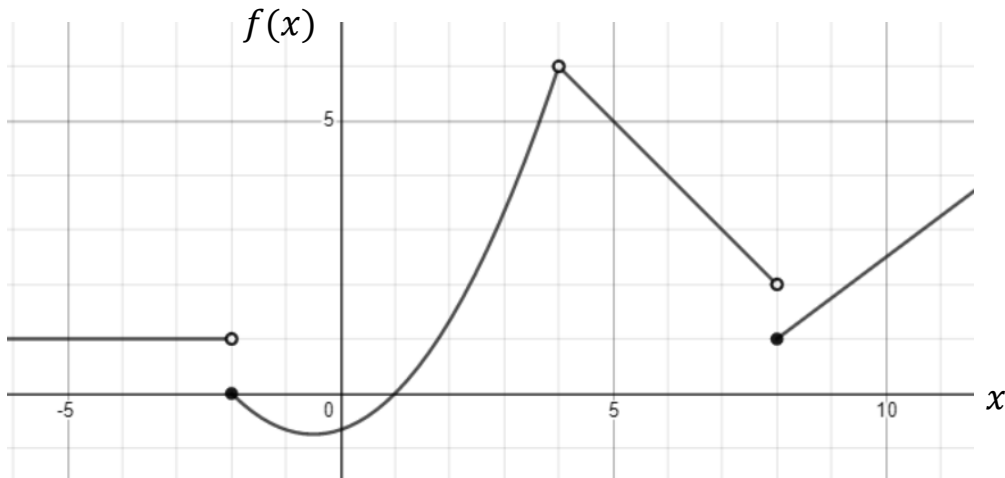




Problem Set 4: Continuity



1. True or false:

a) $f(x)$ is continuous at $x = 4$

b) $\lim_{x \rightarrow 4} f(x)$ exists

c) $f(x)$ is continuous at $x = 0$

d) $\lim_{x \rightarrow -2^-} f(x) = \lim_{x \rightarrow 8^+} f(x)$

2. Is $f(x)$ continuous at $x = 2$

$$f(x) = \begin{cases} 3x - 4, & x \leq 2 \\ 6, & x > 2 \end{cases}$$

AP Calculus AB – Unit 1



3. Is $f(x)$ continuous at $x = -1$?

$$f(x) = \begin{cases} x^2 + 1, & x \leq -1 \\ -2x, & x > -1 \end{cases}$$

4. Is $f(x)$ continuous at $x = 3$?

$$f(x) = \begin{cases} x - 1, & x < 3 \\ 2, & x = 3 \\ -2x + 8, & x > 3 \end{cases}$$

5. Is $f(x)$ continuous at $x = 0$?

$$f(x) = \begin{cases} 5 - 4x, & x > 0 \\ 1, & x = 0 \\ 2x(x - 1), & x < 0 \end{cases}$$

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For the next problems, state the range of x values where $f(x)$ is continuous. Write your answer in interval notation (i.e. $[-2,3) \cup (3, \infty)$).

6. $f(x) = x^2 + 3x + 2$

7. $f(x) = \frac{2x - 4}{x^2 - 4x - 5}$

8.
$$f(x) = \begin{cases} -x + 3, & x < 1 \\ \frac{1}{2}x + \frac{3}{2}, & 1 \leq x < 3 \\ 2\cos(\pi x), & x \geq 3 \end{cases}$$