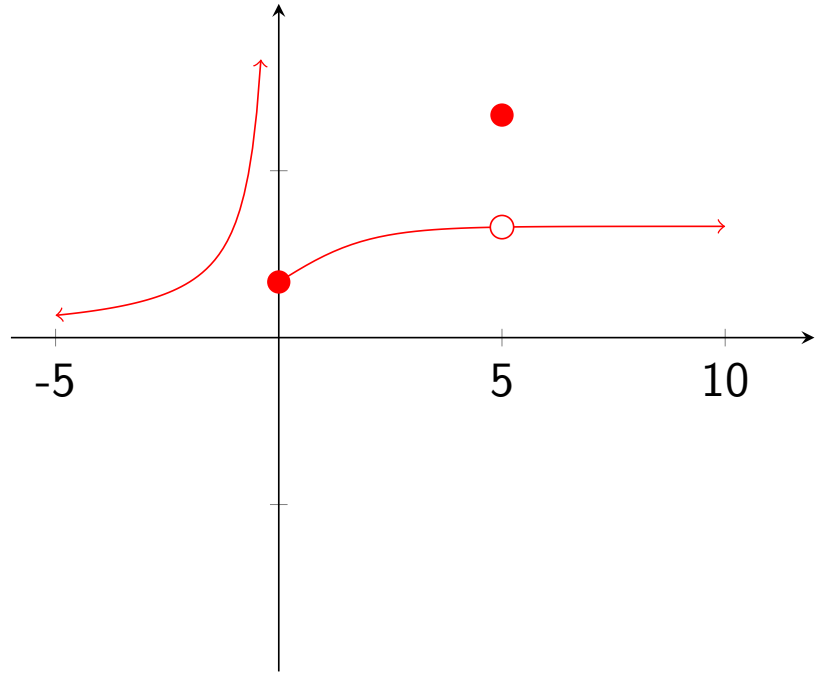
1. Which of the following accurately describes the function f whose graph is depicted to the right?



(A) f is right continuous at 0.

(B) f is left continuous at 0.

(C) f is right continuous at 5.

(D) f is left continuous at 5.

2. True or False?

There exists a function f that is not continuous at $x = 1$, but $\lim_{x \to 1^-} f(x)$ and $\lim_{x \to 1^+} f(x)$ both exist and are equal.

3. True or False?

The function f given by

$$f(x) = \ln(9 - x^2)$$

is continuous on its domain.

4. True or False?

The equation $e^x + \ln x = 0$ has a solution.

5. Consider the function f given by the following formula.

$$f(x) = \begin{cases} x^2 + 3 & \text{if } x < 1 \\ 5 - x & \text{if } x \geq 1 \end{cases}$$

At $x = 1$, f...

(A) is continuous.

(B) has a jump discontinuity.

(C) has an infinite discontinuity.

(D) None of the above.

6. True or False?

$$\lim_{x \to 5} \frac{x^2 + 3x + 2}{x + 2} \text{ exists.}$$

7. True or False?

$$\lim_{x \to 0} \frac{4^{2x} - 1}{4^x - 1} \text{ exists.}$$

8. For how many values of c does the following limit exist?

$$\lim_{x \to c} \frac{x^2 - 5x - 6}{x - c}$$

(A) None.

(B) 1.

(C) 2.

(D) More than 2.

9. For how many values of c does the following limit exist?

$$\lim_{x \to 1} \frac{x^2 + 3x + c}{x - 1}$$

(A) None.

(B) 1.

(C) 2.

(D) More than 2.

10. How many values of c make the function f that is defined by the following formula continuous?

$$f(x) = \begin{cases} \dfrac{x}{|x|} & \text{if } x \neq 0 \\ c & \text{if } x = 0 \end{cases}$$

(A) None.

(B) 1.

(C) 2.

(D) More than 2.

11. True or False?

For any positive integer k, the equation $\cos x = x^k$ has a solution.

12. Consider the function f defined by the following formula.

$$f(x) = \begin{cases} x \sin(1/x) & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

At $x = 0$, f...

(A) is continuous.

(B) has a jump discontinuity.

(C) has a removable discontinuity.

(D) None of the above.

13. Consider the function f given by the following formula.

$$f(x) = \begin{cases} 1/x & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

Which of the following is accurate?

(A) f is discontinuous at 0.

(B) $f(f(x))$ is continuous at 0.

(C) Both (A) and (B).

(D) Neither (A) nor (B).