Quiz 2.4

Name

1. $f(x) = \begin{cases} 2 & \text{for } x < 5 \\ 2x - 4 & \text{for } x \geq 5 \end{cases}$

Let f be the function defined above. Which of the following statements is true?

(A) f is not differentiable at $x = 5$ because f is not continuous at $x = 5$.

(B) f is not differentiable at $x = 5$ because the graph of f has a sharp corner at $x = 5$.

(C) f is not differentiable at $x = 5$ because the graph of f has a vertical tangent at $x = 5$.

(D) f is not differentiable at $x = 5$ because f is not defined at $x = 5$.

2. Which of the following statements about the function f, if true, cannot be used to conclude that f is defined at $x = 1$?

(A) $\lim_{x \to 1} f(x)$ exists.

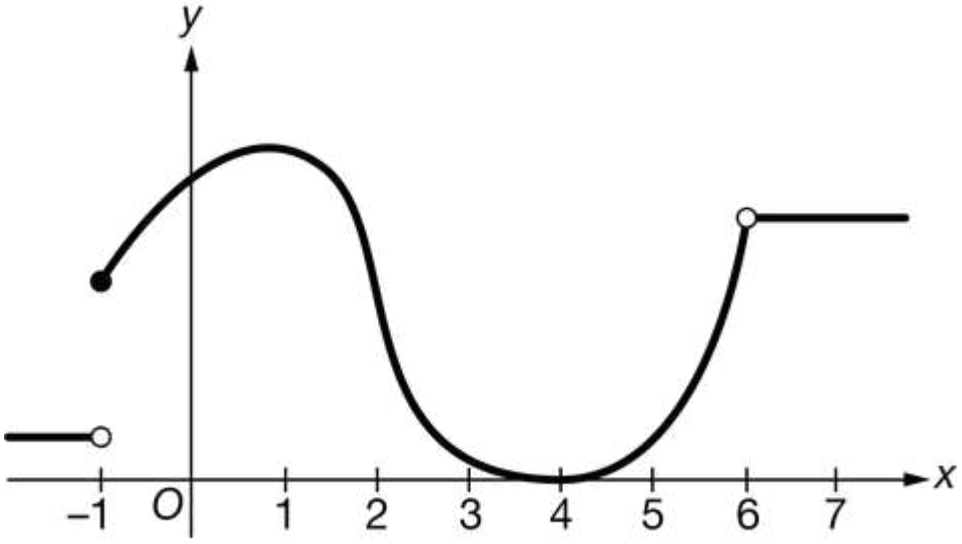
(B) f is continuous at $x = 1$.

(C) f is differentiable at $x = 1$.

(D) The line tangent to the graph of f at $x = 1$ exists.

Quiz 2.4

3.



Graph of f

The figure above shows the graph of a function f, which has a vertical tangent at $x = 2$ and a horizontal tangent at $x = 4$. Which of the following statements is false?

(A) f is not differentiable at $x = -1$ because the graph of f has a jump discontinuity at $x = -1$.

(B) f is not differentiable at $x = 2$ because the graph of f has a vertical tangent at $x = 2$.

(C) f is not differentiable at $x = 4$ because the graph of f has a horizontal tangent at $x = 4$.

(D) f is not differentiable at $x = 6$ because the graph of f has a removable discontinuity at $x = 6$.