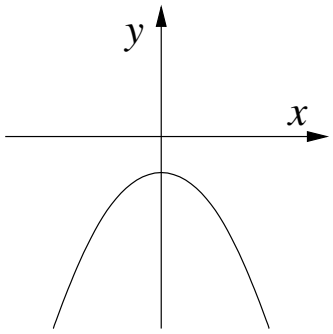
Class prep quiz on section 2.8, Stewart's Calculus (8th ed.)

1. Suppose $f'(4) = 0$. Which of the following **must** be true?
   (a) The tangent line to $y = f(x)$ at $x = 4$ must be horizontal.
   (b) f must be discontinuous at $x = 4$.
   (c) f must be increasing for values of x close to 4.
   (d) We must have $f(4) = 0$.

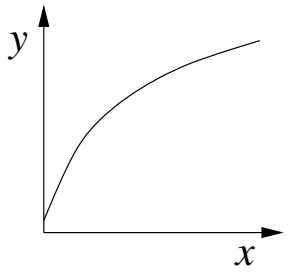
2. Suppose $g(x)$ is a function with the following graph.



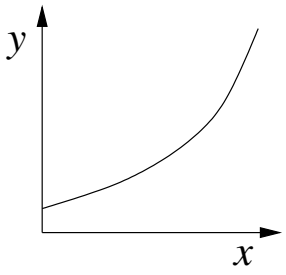
   Which of the following is true?
   (a) $g'(x) < 0$ for $x < 0$ and $g'(x) < 0$ for $x > 0$.
   (b) $g'(x) < 0$ for $x < 0$ and $g'(x) > 0$ for $x > 0$.
   (c) $g'(x) > 0$ for $x < 0$ and $g'(x) < 0$ for $x > 0$.
   (d) $g'(x) > 0$ for $x < 0$ and $g'(x) > 0$ for $x > 0$.

3. Suppose $h(x)$ is a function such that $h'(x) < 0$ and $h'(x)$ is increasing for all x. Which of the following possible graphs of $h(x)$ matches this description?

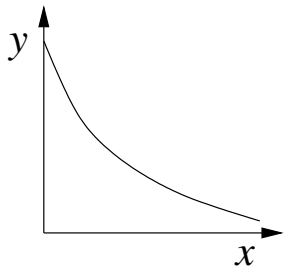
(a)



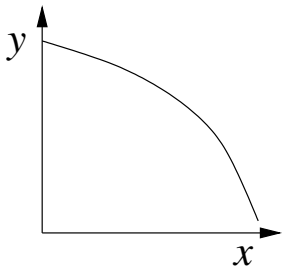
(b)



(c)



(d)



4. Which of the following statements is **not** always true about a function $f(x)$?
   (a) If f is continuous at $x = 7$, then f must be differentiable at $x = 7$.
   (b) If f is differentiable at $x = 7$, then 7 must be in the domain of f.
   (c) If $f'(7)$ exists, then f must be continuous at $x = 7$.
   (d) If $\lim_{x \to 7} f(x)$ does not exist, then f is not differentiable at $x = 7$.