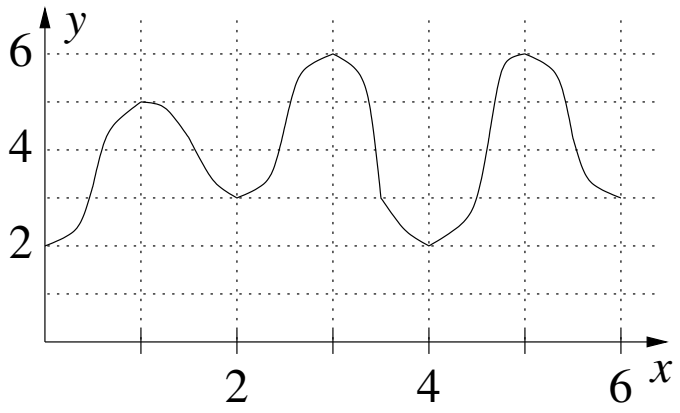
Class prep quiz on section 4.1, Stewart's Calculus (8th ed.)



Suppose $f(x)$ has domain $[0, 6]$ and the graph shown above.

1. At which value(s) of x with $0 \leq x \leq 6$ does $f(x)$ attain an absolute, or global, minimum?

   (a) $x = 4$ (b) $x = 2, 4$ (c) $x = 0, 2, 4, 6$ (d) $x = 0, 4$

2. At which value(s) of x with $0 < x < 6$ does $f(x)$ attain a relative, or local, maximum?

   (a) $x = 3, 5$ (b) $x = 1$ (c) $x = 1, 3, 5$ (d) None of the above

3. Suppose f is a differentiable function with domain $[-2, 8]$, i.e., $f'(x)$ exists for every $x \in [-2, 8]$. Which of the following statements need **NOT** be true?

   (a) f must attain an absolute maximum at some $c \in [-2, 8]$.

   (b) If f has an absolute maximum or absolute minimum at $x = -1$, then $f'(-1) = 0$.

   (c) If f has a local maximum or a local minimum at $x = 3$, then $f'(3) = 0$.

   (d) If $f'(1) = 0$, then f has a local maximum or a local minimum at $x = 1$.

4. Consider $g(x) = x^3 - x^2 - 5x - 10$ on the domain $[-2, 4]$. At which value(s) of x does $g(x)$ attain an absolute minimum, and at which value(s) of x does $g(x)$ attain an absolute maximum?
   (a) Absolute min at $x = -2$ and absolute max at $x = -1$
   (b) Absolute min at $x = 5/3$ and absolute max at $x = -1$
   (c) Absolute min at $x = 5/3$ and absolute max at $x = 4$
   (d) Absolute min at $x = -2$ and absolute max at $x = 4$