

## Check your understanding

4. Consider a parametrized curve  $x = f(t)$ ,  $y = g(t)$ .  
If  $y'(t) = 0$ , then is the tangent line horizontal?

- (a) Yes.
- (b) Maybe.
- (c) No.

Answer: (b)

Explanation: If  $x'(t) \neq 0$  then the tangent line is horizontal. If  $x'(t) = 0$  then the tangent line could have any slope or the tangent line could fail to be defined. In the cycloid example,  $x'(0) = y'(0) = 0$  and the tangent line at  $t = 0$  is not defined.