

# Math 1A: True/False quick quiz

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<http://math.berkeley.edu/~theo/f/09Spring1A/>

Decide whether each of the following statements is TRUE or FALSE. These exercises are from the Chapter 4 review in *Single Variable Calculus: Early Transcendentals for UC Berkeley* by James Stewart.

1. If  $f'(c) = 0$ , then  $f$  has a local maximum or minimum at  $c$ .
2. If  $f$  has an absolute minimum value at  $c$ , then  $f'(c) = 0$ .
3. If  $f$  is continuous on  $(a, b)$ , then  $f$  attains an absolute maximum value  $f(c)$  and an absolute minimum value  $f(d)$  at some numbers  $c$  and  $d$  in  $(a, b)$ .
4. If  $f$  is differentiable and  $f(-1) = f(1)$ , then there is a number  $c$  such that  $|c| < 1$  and  $f'(c) = 0$ .
5. If  $f'(x) < 0$  for  $1 < x < 6$ , then  $f$  is decreasing on  $(1, 6)$ .
6. If  $f''(2) = 0$ , then  $(2, f(2))$  is an inflection point of the curve  $y = f(x)$ .
7. If  $f'(x) = g'(x)$  for  $0 < x < 1$ , then  $f(x) = g(x)$  for  $0 < x < 1$ .
8. There exists a function  $f$  such that  $f(1) = -2$ ,  $f(3) = 0$ , and  $f'(x) > 1$  for all  $x$ .
9. There exists a function  $f$  such that  $f(x) > 0$ ,  $f'(x) < 0$ , and  $f''(x) > 0$  for all  $x$ .
10. There exists a function  $f$  such that  $f(x) < 0$ ,  $f'(x) < 0$ , and  $f''(x) > 0$  for all  $x$ .
11. If  $f$  and  $g$  are increasing on an interval  $I$ , then  $f + g$  is increasing on  $I$ .
12. If  $f$  and  $g$  are increasing on an interval  $I$ , then  $f - g$  is increasing on  $I$ .
13. If  $f$  and  $g$  are increasing on an interval  $I$ , then  $fg$  is increasing on  $I$ .
14. If  $f$  and  $g$  are positive increasing functions on an interval  $I$ , then  $fg$  is increasing on  $I$ .
15. If  $f$  is increasing and  $f(x) > 0$  on  $I$ , then  $g(x) = 1/f(x)$  is decreasing on  $I$ .
16. If  $f$  is even, then  $f'$  is even.
17. If  $f$  is periodic, then  $f'$  is periodic.
18. If  $f'(x)$  exists and is nonzero for all  $x$ , then  $f(1) \neq f(0)$ .
19.  $\lim_{x \rightarrow 0} \frac{x}{e^x} = 1$ .