

# Classroom Voting Questions: Calculus I

## 2.6 Differentiability

1. Your mother says “If you eat your dinner, you can have dessert.” You know this means, “If you don’t eat your dinner, you cannot have dessert.” Your calculus teacher says, “If  $f$  is differentiable at  $x$ ,  $f$  is continuous at  $x$ .” You know this means
  - (a) if  $f$  is not continuous at  $x$ ,  $f$  is not differentiable at  $x$ .
  - (b) if  $f$  is not differentiable at  $x$ ,  $f$  is not continuous at  $x$ .
  - (c) knowing  $f$  is not continuous at  $x$ , does not give us enough information to deduce anything about whether the derivative of  $f$  exists at  $x$ .
2. If  $f'(a)$  exists,  $\lim_{x \rightarrow a} f(x)$ 
  - (a) must exist, but there is not enough information to determine it exactly.
  - (b) equals  $f(a)$ .
  - (c) equals  $f'(a)$ .
  - (d) may not exist.
3. **True or False:** The function  $f(x) = x^{1/3}$  is continuous at  $x = 0$ .
  - (a) True, and I am very confident
  - (b) True, but I am not very confident
  - (c) False, but I am not very confident
  - (d) False, and I am very confident
4. **True or False:** If  $f(x) = x^{1/3}$  then there is a tangent line at  $(0,0)$ .
  - (a) True, and I am very confident
  - (b) True, but I am not very confident
  - (c) False, but I am not very confident
  - (d) False, and I am very confident
5. **True or False:** If  $f(x) = x^{1/3}$  then  $f'(0)$  exists.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident