

# Classroom Voting Questions: Calculus I

## 4.2 Optimization

- True or False:** If  $f(x)$  is continuous on a closed interval, then it is enough to look at the points where  $f'(x) = 0$  in order to find its global maxima and minima.
  - True, and I am very confident
  - True, but I am not very confident
  - False, but I am not very confident
  - False, and I am very confident
  
- True or False:** A function defined on all points of a closed interval always has a global maximum and a global minimum.
  - True, and I am very confident
  - True, but I am not very confident
  - False, but I am not very confident
  - False, and I am very confident
  
- Let  $f$  be a continuous function on the closed interval  $0 \leq x \leq 1$ . There exists a positive number  $A$  so that the graph of  $f$  can be drawn inside the rectangle  $0 \leq x \leq 1$ ,  $-A \leq y \leq A$ .  
The above statement is:
  - Always true.
  - Sometimes true.
  - Not enough information.
  
- Let  $f(x) = x^2$ . **True or False:**  $f$  has an upper bound on the interval  $(0, 2)$ .
  - True, and I am very confident
  - True, but I am not very confident
  - False, but I am not very confident
  - False, and I am very confident

5. Let  $f(x) = x^2$ . **True or False:**  $f$  has a global maximum on the interval  $(0, 2)$ .
- (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
6. Let  $f(x) = x^2$ . **True or False:**  $f$  has a global minimum on the interval  $(0, 2)$ .
- (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
7. Let  $f(x) = x^2$ . **True or False:**  $f$  has a global minimum on any interval  $[a, b]$ .
- (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
8. Consider  $f(x) = -3x^2 + 12x + 7$  on the interval  $-2 \leq x \leq 4$ . Where does this function have its global maximum value?
- (a)  $x = -2$
  - (b)  $x = 0$
  - (c)  $x = 2$
  - (d)  $x = 4$
9. Consider  $f(x) = -3x^2 + 12x + 7$  on the interval  $-2 \leq x \leq 4$ . Where does this function have its global minimum value?
- (a)  $x = -2$
  - (b)  $x = 0$
  - (c)  $x = 2$
  - (d)  $x = 4$