Quiz 14 Key — MA161 — October 24, 2018

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Min	Mean	Max
1	16	20

Suppose $f(x) = \sqrt{3}\sin x + \cos x$.

1. (2 points) Find $f'(x)$.

$$\sqrt{3}\cos x - \sin x$$

2. (10 points) Find all the critical numbers of $f(x)$ in the interval $[0, \pi]$.

$$\pi/3$$

3. (6 points) Evaluate $f(x)$ at $x = 0$, $x = \pi$, and at every critical number you found in part 2.

$$f(0) = 1,\ f(\pi/3) = 2,\ f(\pi) = -1.$$

4. (2 points) Give the maximum and minimum values of $f(x)$ on the interval $[0, \pi]$.

Maximum value is 2, minimum value is -1.
NOTE: this problem appeared on the third midterm in the fall of 2016.