

Calculus 1000A — Fall 2015
Quiz 3

Date: Nov. 11, 2015
Duration: 30 minutes.

Name: _____
Section: 007

This is a multiple-choice test. Circle the best answer. Correct answers will earn you 5 points each. You can score a maximum of 20 points.

Problem 1. Let $f(x) = x^{\frac{1}{x}}$. Then, f is a decreasing function in

- (A) $(1, \infty)$.
- (B) (e, ∞) .
- (C) $(1, e)$.
- (D) $(0, 4)$.
- (E) No interval.

Problem 2. Let $f(x) = 3x^5 - 5x^4$ in $[-1, 2]$. Which of the following statements is true?

- (A) The only critical numbers of $f(x)$ are 0 and 1 and the only inflection point is at $x = 0$.
- (B) The only critical numbers of $f(x)$ are 0 and 1 and f has no inflection points in $[-1, 2]$.
- (C) The only critical numbers of $f(x)$ are 0 and $4/3$ and the only inflection point is at $x = 1$.
- (D) The only critical numbers of $f(x)$ are 0 and $4/3$ and the only inflection points are at $x = 0$ and $x = 1$.
- (E) f has no critical points in $[-1, 2]$ and has one inflection point at $x = 1$.

Problem 3. A kite is flying at an angle of elevation of $\pi/3$. The kite string is being taken in at the rate of 2 feet per second. If the angle of elevation does not change, which of the following statements is correct?

- (A) The kite is losing altitude at the rate of 1 ft. per sec.
- (B) The kite is gaining altitude at the rate of 1 ft. per sec.
- (C) The kite is losing altitude at the rate of 2 ft. per sec.
- (D) The kite is losing altitude at the rate of $\sqrt{3}$ ft. per sec.
- (E) The kite is gaining altitude at the rate of $\sqrt{3}$ ft. per sec.

Problem 4. The length and width of the rectangle of largest area that can be inscribed in a circle of radius $\sqrt{2}$ cm are

- (A) 4 and 3 cm, respectively.
- (B) 2 and 2 cm, respectively.
- (C) 5 and 2 cm, respectively.
- (D) $2\sqrt{3}$ and $\sqrt{3}$ cm, respectively.
- (E) 1 and 1 cm, respectively.