ACTM Regional Pre-Calculus/Trig Exam

March 7, 2015

Mark your answer choice on the answer sheet provided. If you have time, answer each of the tiebreaker items in sequential order (do #1 first, followed by #2, and then #3 last). Be sure that your name is printed on each of the tiebreaker pages.

1. If the standard form of a complex number is , what is if ?

a.) 2 b.) 2/5 c.) 1/2 d.) -2

1. What is the rectangular equation of the polar equation ?

a.) b.)

c.) d.)

1. Let and , find .

a.) 2 b.) c.) 2 d.)

1. The solution set for the equation where is

 a.) b.) c.) d.)

1. Find the exact value of .

 a.) b.) c.) d.)

1. Which one is an even function?

a.) b.) c.) d.)

1. Find the distance between complex numbers and .

a.) b.) c.) d.)

1. Find polar form of the point with rectangular coordinates such that and .

a.) b.) c.) d.)

1. Find the area of the SAS triangle with .

a.) b.) c.) d.)

1. Find the exact value of

a.) b.) c.) d.) none of these

1. If and find .

a.) b.) c.) d.)

1. Determine the solution set of the equation .

 a.) b.) c.) d.) none of these

1. Find the focus of the parabola .

a.) b.) c.) d.)

1. Find the inverse function of .

a.) b.)

c.) d.)

1. Find the oblique (slant) asymptote of the function .

a.) b.) c.) d.)

1. A baseball diamond is a square with sides of length 90 feet with the four bases at the corners. The distance from home plate to the fence in dead center in Busch Stadium is 402 feet. Approximately how far is it from the fence in dead center to first base?

a.) 354.34 ft b.) 378.16 ft c.) 344.29 ft d.) 383.47 ft

1. Determine the solution of the inequality

a.) b.)

c.) d.) none of these

1. Express in terms of .

a.) b.) c.) d.)

1. Determine .

a.) b.) c.) d.)

1. Convert to radians and write as the least possible positive coterminal angle.

a.) b.) c.) d.)

1. If , find the value of .

 a.) 2 b.) 6 c.) d.) 0

1. Evaluate

 a.) 2730 b.) 60 c.) 315 d.) 455

1. Which of the following is equivalent to .

 a) b)

c) d) none of these

1. Find the domain of .

 a) b) c) d)

1. Find the equation of the hyperbola with foci and vertices .

 a) b) c) d)

**TIEBREAKERS**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show all your work to receive maximum credit.

1. A security camera in the lobby of a bank is mounted on a wall 10 feet above the floor. How should the camera be angled if it is to be directed to a spot 6 feet above the floor and 15 feet from the wall?

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. What is the domain of ?

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Evaluate exactly: .

ANSWERS

1. B
2. D
3. C
4. C
5. D
6. C
7. A
8. A
9. D
10. C
11. A
12. B
13. A
14. D
15. A
16. C
17. C
18. A
19. A
20. C
21. B
22. D
23. A
24. D
25. B

Tiebreaker 1:

The angle that the camera makes with the wall is or approximately 75 degrees. The complimentary angle or approximately 15 degrees is also acceptable.

Tiebreaker 2

Tiebreaker 3

63/16