

Test Sections 4.1 – 4.3 A.P. Calculus

I. Multiple Choice

1 – 13. Questions unavailable

II. Free Response

SHOW ALL WORK ON YOUR OWN PAPER.

14. Determine  $\frac{dy}{dx}$  if  $5x^2 + 4y^2 = 144$

15. Explain the difference between  $y = \log x$  and  $y = \ln x$ .

16. Derive the formula for the derivative of  $y = \log_a u$ ,  
where  $u$  is a function of  $x$  and  $a$  is a constant.

17. Graph the function  $y = e^x$ .

18. State the three basic properties of logarithms.

19. Evaluate  $\frac{d}{dx}(x^e e^x) =$

20. If  $y = 4^x$ , Determine  $\frac{dy}{dx}$ .

21. Solve for  $x$ :  $5^x = 12$

22. Determine  $\frac{dy}{dx}$  if  $x^3 + y^3 = 4xy$

23. Determine  $x$ , given that  $\log_2(\log_2(\log_2 x)) = 2$

24. Two ships leave port at noon. One ship sails north at 6 miles per hour and the other sails east at 8 miles per hour. At what rate are the two ships separating 2 hours later?

25. Sand is falling into a conical pile so that the radius of the base of the pile is always equal to one half of its altitude. If the sand is falling at the rate of 10 cubic feet per minute, how fast is the altitude of the pile increasing when the pile is 5 feet deep?