



**MAC1140**

**Pre-Calculus Algebra**

**Final Examination Topic Outline**

1. Solve exponential equations.
2. Use the definition of the logarithm to change from logarithm form to exponential form and back.
3. Simplify logarithmic expressions.
4. Rewrite logarithmic expressions utilizing logarithmic properties to expand/condense.
5. Use the change of base to find approximations.
6. Graph logarithmic & exponential functions.
7. Solve exponential & logarithmic equations & inequalities and associated applications.
  
8. Identify a given conic as a circle, parabola, ellipse, or hyperbola.
9. Find the location of the radius, center, vertices, and foci, as applicable for a given conic.
10. Write a given conic in standard form [appropriate to the conic it is].
11. Calculate the eccentricity of a given conic.
12. Find the equation of a conic with center at the origin from given information.
13. Sketch the graph of a given conic; label all pertinent values on the graph.
14. Sketch the graph of a given parametric function.
15. Find the rectangular form for a given parametric function.
16. Find a parametric representation for a given expression.
17. Solve applications involving conic sections or parametric functions.
  
18. Solve a system of equations [graphically or analytically].
19. Write the augmented matrix of a given system.
20. Write the system of equations for a given augmented matrix.
21. Solve a system of equations by elementary row operations.
22. Perform requested operations on a given matrix, if possible.
23. Find the Determinant of a given matrix.
24. Solve a system of equations by Cramer's Rule.
25. Find the inverse of a matrix.
26. Identify the coefficient, variable, and constant matrices of a given system.
27. Solve a system of equations by using inverse matrices.
28. Solve a system of inequalities and linear programming applications
29. Find the partial fraction decomposition of a given expression.
30. Determine if a given decomposition is correct.



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31. Convert between Polar & Rectangular form for complex numbers.
32. Calculate products, quotients,  $n$  powers, and  $n^{\text{th}}$  roots of complex numbers in polar form.
33. Sketch the graphs of the  $n^{\text{th}}$  roots of a given complex number.
34. Convert between polar and rectangular form for functions
35. Sketch polar graphs.
  
36. Evaluate a given series.
37. Rewrite a given summation by adjusting the index.
38. Simplify/find requested parts for a given arithmetic/geometric series.
39. Determine convergence/divergence of a given sequence; find the limit if it converges.
40. Find requested information about an annuity.
41. Determine the binomial coefficient.
42. Use the Binomial Theorem to expand a given binomial.
43. Find a specific term in a given binomial.
44. Determine the  $S_{k+1}$  term for a given statement
45. Use Mathematical Induction to prove a given statement.
  
46. Find the limit of a function, this includes one-sided limits & limits as  $x \rightarrow \infty$
47. Determine if a limit exists, if it does not give a reason why
48. Find the limit of a trigonometric function
49. Find the limit as  $h \rightarrow 0$  using the difference quotient  $[f(x+h) - f(x)]/h$
50. Solve associated applications

Chapter Review Questions:

Ch. 5	p. 387	Review 1 – 87;	Test 1 – 15
Ch. 6	p. 432	Review 1 – 62;	Test 1 – 14
Ch. 7	p. 522	Review 1 – 27, 29– 87;	Test 1 – 7c, 8 – 12
Ch. 10	p. 762	Review 39 - 78;	Test 6 – 10
Ch. 11	p. 826	Review 1 – 38, 45 – 58;	Test 1 – 4, 6 – 7
Ch. 12	p. 869	Review 1 – 52;	Test 1 – 18

*And study your Take-home & On-line Quizzes*