

MATH 29—OUTLINE FOR EXAM 3

Sections covered: 3.2–3.6, 4.1–4.5

Main ideas

- A. Exponential and logarithmic functions
- B. Measuring angles
- C. Trigonometric functions

Skills you should have

1. Be able to work with exponents and logarithms
 - Be able to do basic computations with exponents and logarithms by hand (e.g. 2^4 or $\log_3 27$)
 - Be able to use properties of exponents and logarithms to simplify or expand expressions
 - Be able to solve equations involving exponents and logarithms
2. Be able to work with exponential and logarithmic functions (possibly shifted and scaled)
 - Be able to determine the domain, range, horizontal asymptotes, and vertical asymptotes
 - Be able to graph exponential and logarithmic functions (possibly shifted and scaled)
 - Be able to write an equation for an exponential or logarithmic function given the graph
3. Be able to build models for growth and decay word problems using exponential functions
 - Focus on population growth, radioactive decay, and money that gains interest
 - Be able to analyze the model to answer follow-up questions
4. Be able to determine the measure of angles and convert between degrees and radians
5. Be able to precisely compute the trig. functions for different angles
 - Know the points on the unit circle corresponding to special angles like $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}$, etc.
 - Know how to compute the trig. functions from points on the unit circle
 - Know how to compute the trig. functions from points on a circle of radius r
 - Know how to compute the trig. functions from a right triangle
6. Know the relationships between the trig. functions
 - Know how to use values for $\sin \theta$ and $\cos \theta$ to compute the values of the remaining trig. functions
 - Know and be able to use the basic pythagorean identity: $\sin^2 \theta + \cos^2 \theta = 1$
7. Be able to solve word problems using triangles and trigonometry
8. Be able to work with the sine and cosine functions (possibly shifted and scaled)
 - Be able to determine the amplitude, period, phase shift and vertical shift
 - Be able to graph sine and cosine functions (possibly shifted and scaled)

How to study

- I. Review core topics.
- II. Work *lots* of problems all of the way through—focus on ALEKS problems, problems from class, and problems from the book.
 - I made homework assignments in ALEKS that are *worth no credit* for you to review. They are titled “Review for Section XXX (no credit)”
 - You can also redo worksheets from class—they are posted on the course website (link is in Canvas)
- III. Practice doing several problems in a short amount of time.
- IV. Come talk with me if you have any questions!