Math 412 final exam list and study guide.

Trigonometry:

* A trigonometric equation problem (eg.  )
* Deriving several of the basic trigonometric formulas from still more basic formulas.
  + You’re expected to have memorized the formulas for tan, cot, sec and csc in terms of sin and cos; the Pythagorean identity and the sum of angles formulas for sin and cos.
  + You need to know how to derive the Pythagorean identities for tan and cot, and the double angle formulas for sin and cos. You need to know how to get the half angle formulas from the double angle formulas for cos. You need to know how to get the product to sum formulas from the sum of angles formulas.
* There will be a few trigonometric identities to prove that are similar to ones you have proved on previous assignments. Practicing the ones you have already done (especially if you’re looking for clues for what strategies to use) is a good way to study. Many of the identities you have proved have several very similar variations.
* Finding the area of a regular polygon using the regular polygon area formula and trigonometry. (includes using the number of sides and apothem to find the side length or vice versa).
* Finding the areas of similar shapes given an area and a scale factor or an area and a pair of side lengths.
* Finding a number pattern or the self-similarity dimension for a self-similar fractal.
* Finding a surface area?
* Finding a tessellation pattern?
* Finding an incenter or circumcenter.
* Proving that the angle bisectors or perpendicular bisectors are concurrent.
* Solving problems with similar triangles
* Constructing and calculating a geometric mean
* Solving problems with the law of sines and law of cosines
* Solving problems with sines and cosines without using the law of sines.
* Using circle theorems to find relationships between angles.

Think about these diagrams.

 