

**Math 4990 Problem Set 2***Due Tuesday, Sep 16, 2014 in class*

## INSTRUCTIONS

As before, write your solutions neatly and clearly, with complete justification (*i.e.*, proof). Please don't submit scratchwork. Consider using L<sup>A</sup>T<sub>E</sub>X. Draw figures (possibly by hand) whenever suitable.

Collaboration is encouraged, as long as you

- (1) understand your solutions,
- (2) write your solutions in your own words without copying, and
- (3) **indicate the names of your collaborators.**

Unless otherwise specified, all numberings refer to the textbook [DO].

## ASSIGNMENT

Liberally peruse **pages 11–21** of [DO].

Do **Exercise 1.22** about the number of triangulations.

Read (and understand) Lemma 1.18 (and its proof). Do **Exercise 1.30**.

Do **Exercise 1.31** about guards that cover the boundary but not the interior.

Review the (beautiful) proof of the Art Gallery Theorem, then do **Exercise 1.35** and **Exercise 1.36** about galleries with polygonal holes.

Theorem 1.38 has a typographical error. The guards should be stationed on the boundary of the fortress. Namely, it should read: “To cover the *exterior* of polygons with  $n$  vertices,  $\lceil n/2 \rceil$  **boundary** guards are needed for some polygons, and sufficient for all of them.” Do **Exercise 1.39** and **Exercise 1.40**.

Optionally, for no credit, do **Exercise 1.26**.