

MATH 306

Homework 4

DUE: TUESDAY 6 February, 2007 at 5:00pm

1. section 3.2 #1

You are asked to prove a particular fact first using algebra. Note that the back of the book helps but it is not a complete proof. Make sure to add the details. Second, you are supposed to do a proof-by-picture for the specific case when $n = 2$. After you have done this, you should be able to draw a proof-by-picture for a general n .

2. section 3.2 #4c

3. section 3.2 #7ab

Note that, as in the first problem, you are supposed to offer an algebraic argument and then a picture argument for both parts a and b. The algebra part should be very similar for parts a and b and the back of the book should help. Do not use induction here. However, the picture-proofs for parts a and b should be DIFFERENT.

4. section 3.3 #15

Again the back of the book gives guidance, but not a complete argument. Make sure to add the details.

5. section 3.3 #22,23

Both of these ask you to check that a particular construction produces a line segment of length \sqrt{n} (give or take a constant...) In addition to the stated problem, explain how you would go about constructing one of the triangles in #22. That is, given two specific lengths for one leg and the hypotenuse, how do you construct the triangle?

6. section 3.4 #7

This problem leads you through a scheme for duplicating the cube. The algebra is a bit tedious, but not hard! However, you should be asking yourself, WHAT IS WRONG HERE? We're told it isn't possible to duplicate the cube with only a straightedge and compass.

7. section 3.4 #8

8. section 3.5 #2,3

Both of these have BIG hints in the back, but not all the details!