Math 6140: Homework # 8.

Before starting these problems, you should review Theorems 21, 22 and 23 (The Law of Sines), from McClure's Notes.

1. (See Figure 1.) Given $ABCD$ is a parallelogram, and BG is parallel to DH. To prove: $DF = BE$.
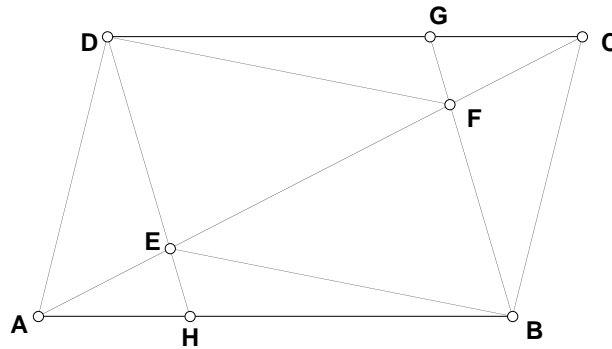

Figure 1

2. (See Figure 2.) Given: $\angle 1 = \angle 2$. To prove: $\dfrac{AD}{AC} = \dfrac{BD}{BC}$. (Hint: you don't need to draw in any extra lines.)
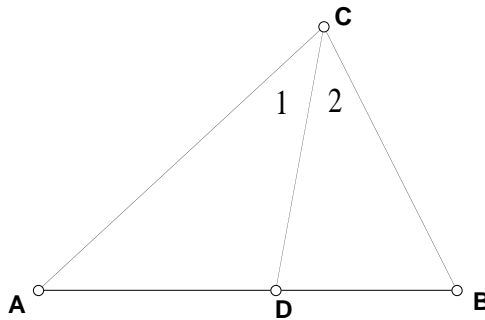

Figure 2

3. See Figure 3. Given: M, N and P are midpoints; $DE = AP$, $DF = BN$, and $EF = CM$. To prove: the area of $\triangle DEF$ is 3/4 of the area of $\triangle ABC$. (Hint: The triangle $\triangle DEF$ turns out to be congruent to a triangle that appears in the Figure illustrating Problems 3 and 4 of Homework 7. You may use what you proved in those problems.)
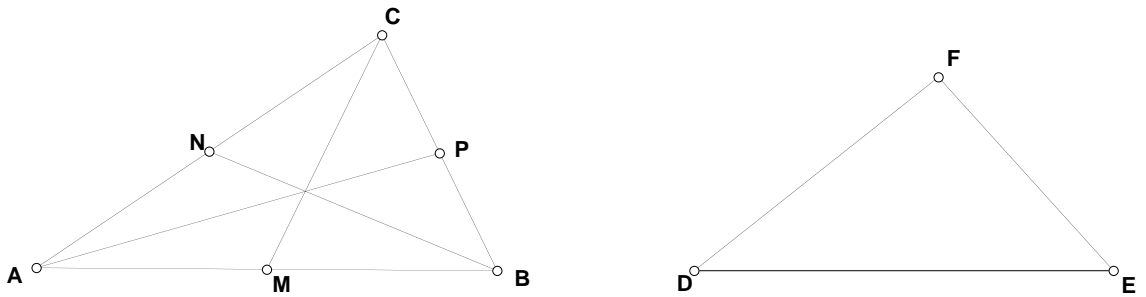

Figure 3

4. (In this problem we prove what you discovered in Problem 2 of Assignment 7.) See Figure 4. Given: the things that look like squares are squares. To prove: the areas of the shaded triangles are all equal.
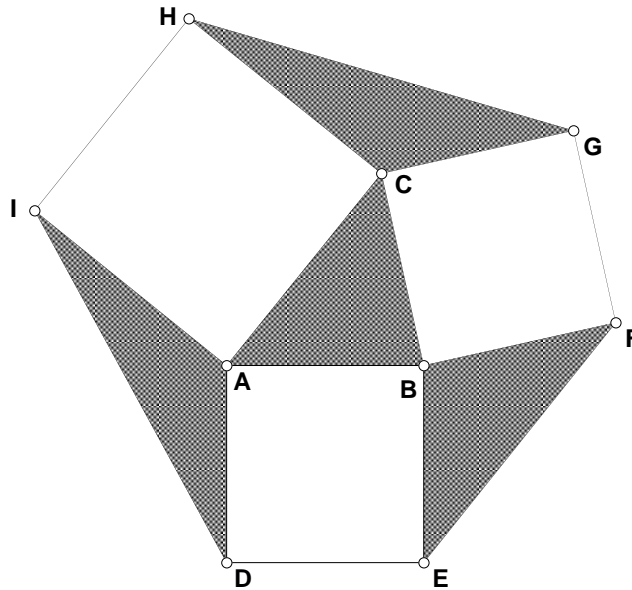

Figure 4

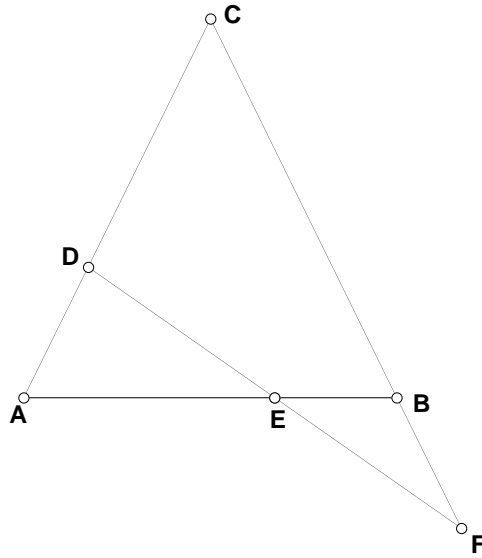5. (See Figure 5.) Given: $AC = BC$ and $AD = BF$. To prove: $DE = EF$. Do not draw in any extra lines!

Figure 5

— The End —