

**MATH 3500(H)**  
**PROBLEM SET #1**

DUE Wednesday, August 27, 2014.

*Problems to work but not hand in:*

§1.1: #2, 3, 6, 9.

§1.2: #1c,f, 2c,f, 3, 6, 8, 12.

§1.3: #1, 2.

*Problems to turn in:*

WeBWork Homework 1

Log in at [https://webwork.math.uga.edu/webwork2/MATH3500\\_Shifrin\\_F14](https://webwork.math.uga.edu/webwork2/MATH3500_Shifrin_F14) using your UGAMyID as your username [*no caps*] and *all but the last digit* of your 81x number, formatted as 81xxxxxxx, as your password. You can then change your password. If you get a message about a security certificate, you can read about this on our course homepage

<http://www.math.uga.edu/~shifrin/MATH3500>

You can try each problem up to 4 times; email me if you get stuck or need an extra try or two. Answers will be available shortly after the homework is due. Note that the WeBWork homework will generally be due Saturday evenings at 11 pm. *Half* your WeBWork score will be added to your written homework grade.

§1.1: #4\* (2), 5 (2), 10 (3), 11 (3).

§1.2: #14<sup>†</sup> (3), 15 (3), 17 (3), 20 (3), 22 (4).

§1.3: #3 (2).

*Challenge problems* (Turn in separately):

§1.1: #13 (3).

**A.** (4) Recall that the centroid of a triangle is the point where its medians intersect. Given  $\triangle ABC$ , which triangles with vertices on the edges of the original triangle have the same centroid? (**Hint:** Exercise 1.1.9 may be of use.)

**B.** (4) Suppose  $ABCD$  is a convex quadrilateral whose opposite edges are not parallel. Let  $E$  be the point of intersection of  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  and  $F$  that of  $\overleftrightarrow{AD}$  and  $\overleftrightarrow{BC}$ . Use vector methods to prove that the midpoints of  $\overline{AC}$ ,  $\overline{BD}$ , and  $\overline{EF}$  are collinear.

§1.2: #18 (3), 23 (4), 24 (3), 25<sup>‡</sup> (4), 26 (4).

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\*Use vector methods!

<sup>†</sup>The geometric challenge can be turned in for 3 points of extra credit.

<sup>‡</sup>Alternative hint: You can do part b. directly without the formula in part a.