Math 30 – Geometry – Chapters 3 – 5 Test – Fall '12 Name_____
Explain your answers. Write all responses on separate paper. Due October 29.

1. Is there such a thing as an obtuse right triangle? Explain why there is, or isn't such a thing.

2. Draw an equilateral triangle and indicate its exterior angles. What is the degree measure of these exterior angles?

3. Draw an obtuse isosceles triangle with acute angle of 30°. What is the measure of the obtuse angle?

4. What are the remote interior angles to $\angle A$ in ΔPAQ? How is the exterior angle at A related to these remote interior angles?

5. If the perimeter of an equilateral triangle is 7 cm, what is the length of each side. Write this as a mixed number.

6. If the base of an isosceles triangle is 40 meters and the perimeter is 90 meters, what is the length of each side?

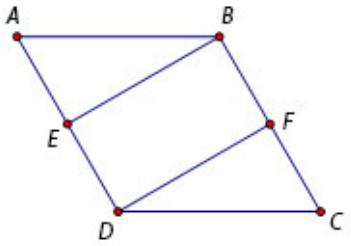
7. If you have a two right triangles, ΔABC and ΔLMN, and you know $AB = LM$ and $BC = MN$. What theorem would you use to prove ΔABC is congruent to ΔLMN?

8. Draw a diagram for and prove the following theorem: If $\overrightarrow{AC}$ bisects $\angle BAD$ and $\overline{AB} \cong \overline{AD}$ then $\overline{BC} \cong \overline{DC}$.

9. Draw an appropriate figure for and prove the following theorem: If $\overline{AB} \cong \overline{BC}$, $\overline{BD}$ bisects $\angle ABC$ and ΔADB and ΔCDB are right triangles then $\Delta ADB \cong \Delta CDB$.

10. If one angle of a parallelogram is twice the measure of another angle, what is the measure of each angle?

11. Given $ABCD$ is a rhombus, $\overline{BE} \perp \overline{AD}$ and $\overline{DF} \perp \overline{BC}$, prove $\overline{BE} \cong \overline{DF}$. Present your proof in 2-column form with deduced statements in one column and their justifications in the other.

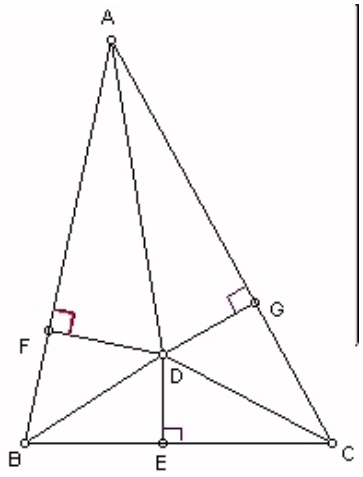


12. Prove that if the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle. Present your proof in 2-column form, with statements and justifications, as usual.

13. Given trapezoid $ABCD$ with $\overline{AB}||\overline{CD}$ and median $\overline{EF}$, prove that $\overline{EF}||\overline{AB}$, $\overline{EF}||\overline{CD}$ and $EF = \frac{1}{2}(AB + CD)$ Present your proof in 2-column form, with statements and justifications, as usual.

14. Write the justification for each statement in the proof. Where is the flaw?

Claim: Given scalene triangle *ABC*, *AC* = *AB*.



Statement	Justification
1. In ΔABC, draw the angle bisector for $\angle A$	
2. Draw the perpendicular bisector of $\overline{BC}$.	
3. From the point of intersection of these bisectors, *D*, draw perpendiculars to $\overline{AB}$ and $\overline{AC}$, meeting these at *F* and *G*, respectively.	
4. $\Delta FAD \cong \Delta GAD$	
5. $\overline{FD} = \overline{DG}$	
6. $\Delta BED \cong \Delta CED$	
7. $\overline{BD} = \overline{DC}$	
8. $\Delta FDB \cong \Delta GDC$	
9. $\overline{FB} = \overline{GC}$	
10. $\overline{AB} = \overline{AC}$	