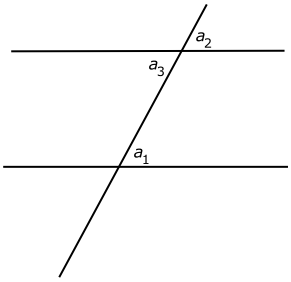
MATH 5: HOMEWORK 27
GEOMETRY REVIEW.

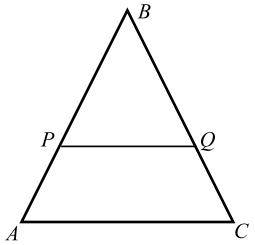


Parallel lines and alternate angles

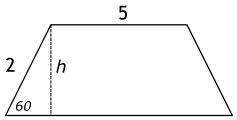
If one has two parallel lines and intersects both of them by a third line as shown in the figure to the right, then angles labeled by letters a_1, a_3 (alternate interior angles) will be equal. Conversely, if these two angles are equal, then the lines must be parallel.

1. Let $ABCD$ be a rectangle.
   (a) Explain why the triangles ABC and ABD are congruent.
   (b) Explain why in a rectangle, the two diagonals are equal.

2. Triangle ABC is isosceles, and $\angle A = 50°$.
   (a) Find the other angles in the triangle.
   (b) In the same triangle, line PQ is parallel to AC. Find angles $\angle P$, $\angle Q$.
   (c) Prove that $BP = PQ$.

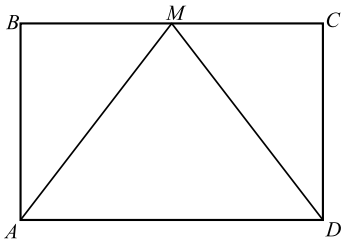


3. The figure to the right shows some of the angles and sides in a trapezoid. The height h of this trapezoid is equal to $\sqrt{3}$. Find all other angles, sides and area of the trapezoid. (Hint: you will need Pythagorean theorem!)

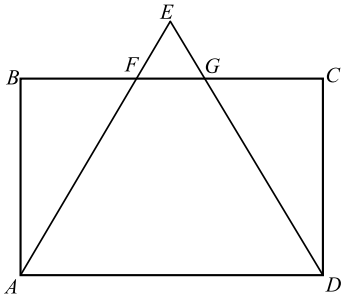


4. Explain how one can construct a rectangle with given sides a, b, using only ruler and compass (but not the protractor!).

5. In the figure to the right, $ABCD$ is a rectangle, and M is the midpoint of BC. Prove that then triangle AMD is isosceles.



6. In the figure to the right, $ABCD$ is a rectangle, and $AE = DE$. Prove that then $BF = CG$.



7. The following list shows some numbers, written by words in the language of some Pacific island nation. Each next number is equal to the previous one plus 2. Can you determine what these numbers are?

thabung ke nua lo
thabung ke nua vak
libenyita ke nua khasa
libenyita ke nua kun
libenyita ke nua thabung
libenyita ke nua thabung ke nua lo
libenyita ke nua thabung ke nua vak