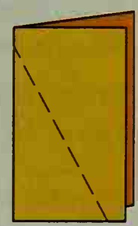
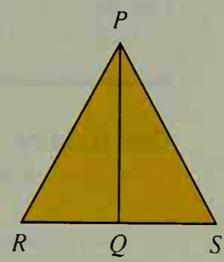
You can use the steps described below to form an isosceles triangle. Refer to the diagrams shown.

(1) Fold a sheet of paper in half.
(2) Cut off a double-thickness corner piece along the dashed line.
(3) Open the corner piece and lay it flat. You will have a triangle, which is labeled $\triangle PRS$ in the diagram. The fold line is labeled $\overline{PQ}$.
(4) Since $\overline{PR}$ and $\overline{PS}$ were formed by the same cut line, you can conclude that they are congruent segments and that $\triangle PRS$ is isosceles.



Since $\triangle PRQ$ fits exactly over $\triangle PSQ$ when you fold along $\overline{PQ}$, you can also conclude the following about isosceles $\triangle PRS$:

$\angle PRS \cong \angle PSR$
$\overline{PQ}$ bisects $\angle RPS$.
$\overline{PQ}$ bisects $\overline{RS}$.
$\overline{PQ} \perp \overline{RS}$ at Q.
$\triangle PQR \cong \triangle PQS$



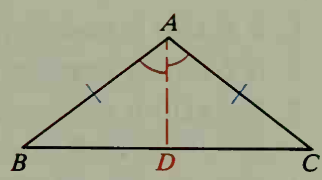
These observations suggest some of the following results.

Theorem 4-1 *The Isosceles Triangle Theorem*

If two sides of a triangle are congruent, then the angles opposite those sides are congruent.

Given: $\overline{AB} \cong \overline{AC}$

Prove: $\angle B \cong \angle C$



Plan for Proof: You can show that $\angle B$ and $\angle C$ are corresponding parts of congruent triangles if you draw an auxiliary line that will give you such triangles. For example, draw the bisector of $\angle A$.

Theorem 4-1 is often stated as follows: Base angles of an isosceles triangle are congruent. The following corollaries of Theorem 4-1 will be discussed as classroom exercises.

Corollary 1
An equilateral triangle is also equiangular.

Corollary 2
An equilateral triangle has three 60° angles.

Corollary 3
The bisector of the vertex angle of an isosceles triangle is perpendicular to the base at its midpoint.