<u>Paper Folding</u>:

Two Basic Constructions and Why They Work

By Jacqueline McLemore

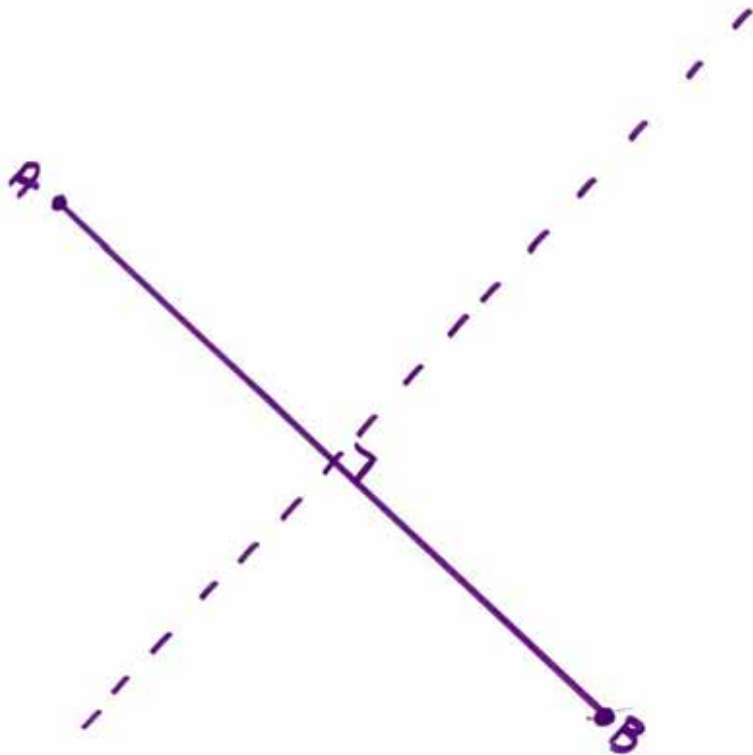Perpendicular Bisector of a Line Segment: Definitions

Perpendicular: when two lines intersect each other creating at least one right angle.

Bisect: to cut into two equal parts.

Perpendicular Bisector: a perpendicular bisector is a line that cuts another line segment into two equal parts, while forming a right angle at the point of intersection.

Line M and line L are PERPENDICULAR

Line P has been BISECTED

Line R is a PERPENDICULAR BISECTOR of Line Q
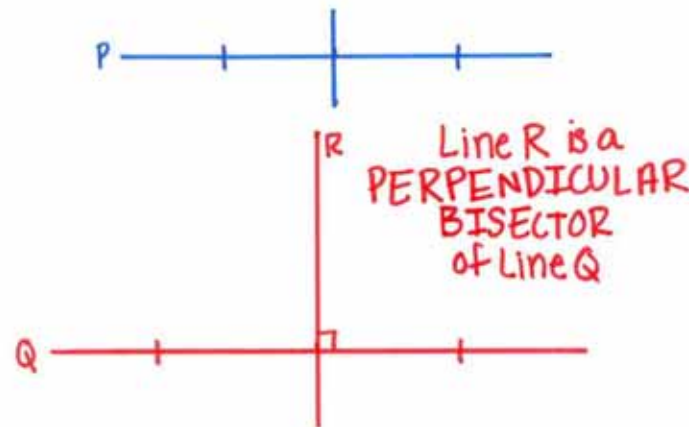
Folding the Perpendicular Bisector of a Line Segment:
An Example

A

B

Directions for Folding the Perpendicular Bisector of
A Line Segment

1. Find point A and point B on the line segment.
2. Fold over point A to point B so that they are on top of each other and so that the line segment is folded on itself.
3. Open the paper back up and draw a line on the crease created from the fold in step 2.
4. You now have a perpendicular bisector of line segment AB.

A

B
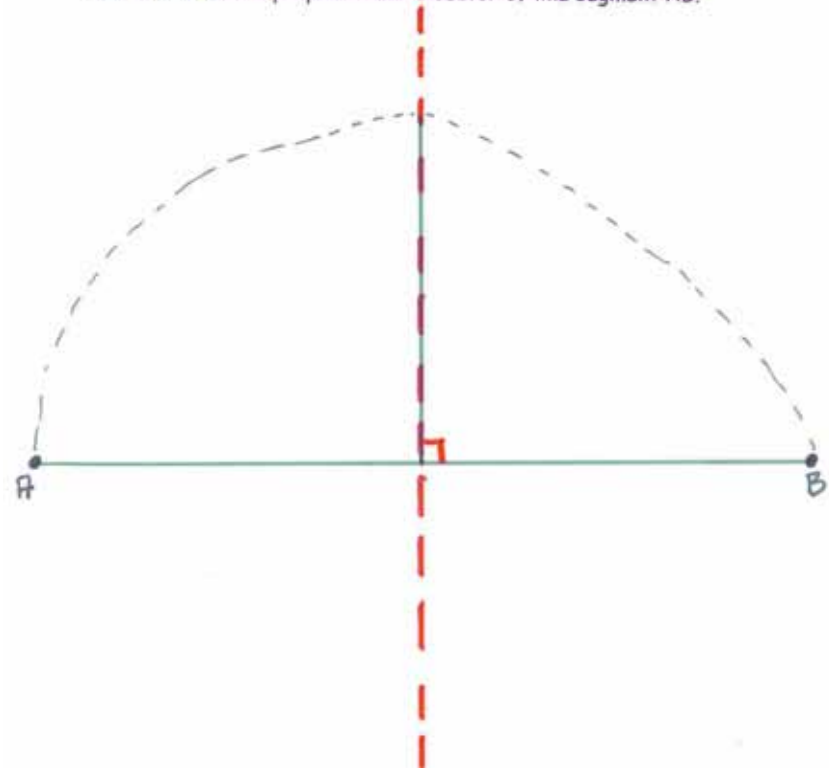
How do we know?

How do we know that the line just created really is a perpendicular bisector of line segment AB? There a few tests that can be done in order to make sure we have created a perpendicular bisector.

A. Lay the two segments on top of each other to make sure they are the same length.

B. Use a ruler to measure the two new line segments created by the fold. They should be equal.

3 ½ inches   3 ½ inches

C. Use a corner of a sheet of paper to check for a right angle by placing the corner of the paper where the lines intersect, if the corner fits you have a right angle and the lines are perpendicular.
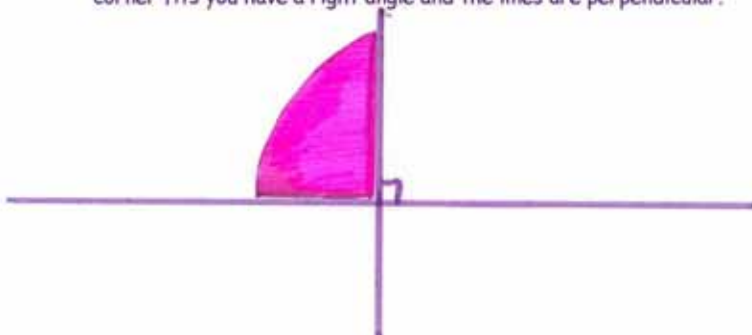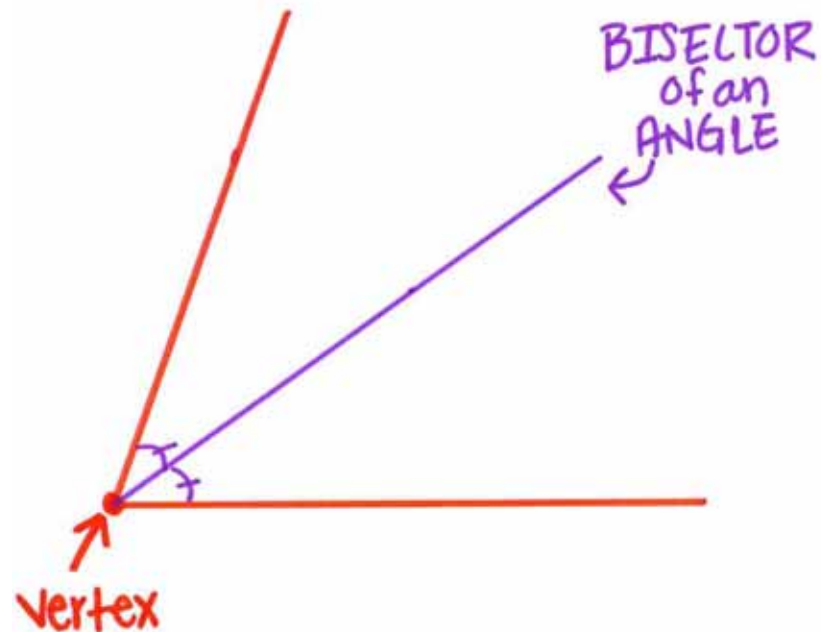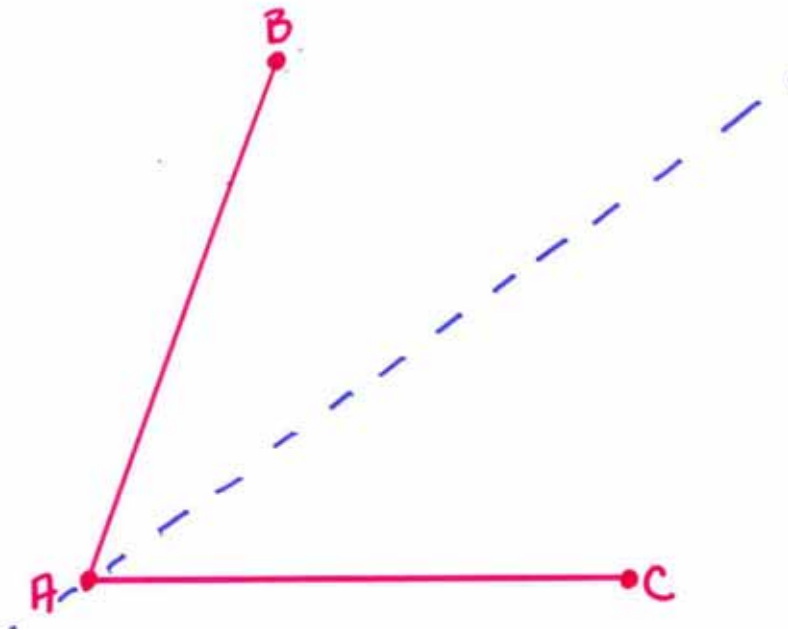
Bisector of an Angle: Definitions

Bisect: to cut into two equal parts.

Bisector of an Angle: a line that runs through the vertex* of an angle, thus creating two new angles of equal measure.

*Vertex: the point of the angle where the two sides of the angle meet.

BISELTOR of an ANGLE

Vertex

Folding the Bisector of an Angle: An Example

## Directions for Folding the Bisector of an Angle

1. Locate point A, the vertex, and points B and C on the legs of the angle.
2. Fold point B on top of point C, making sure the segments AB and AC are lying on top of each other, and fold through point A.
3. Open the paper and draw a line on the fold.
4. You now have the bisector of the angle.
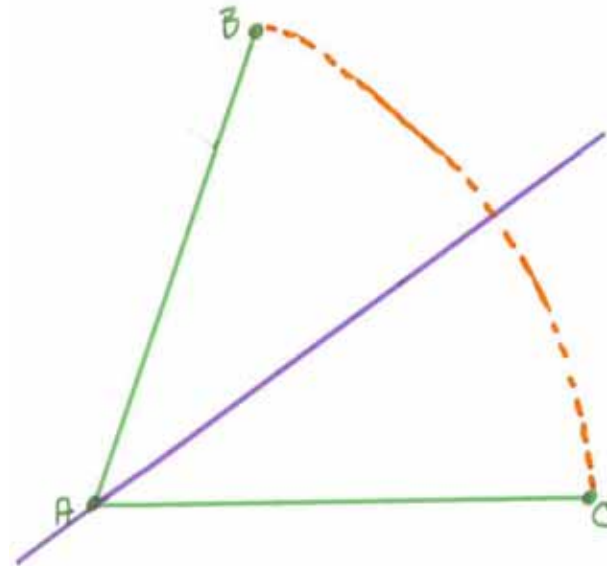
How do we know?

How do we know that the line created is the bisector of the angle? There are some ways to check to make sure that the two newly created angles are the same.

A. You can use a protractor to measure the two angles and if they have the same measurement the original angle has been bisected.
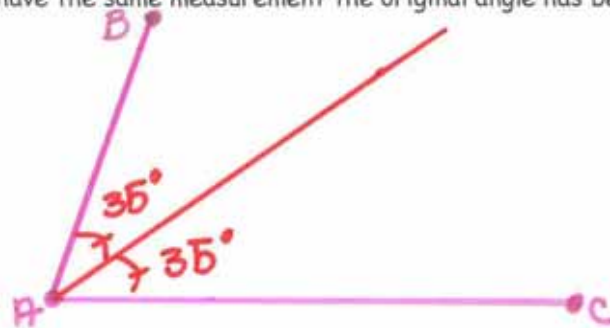
B. You can lay the two angles on top of each other. If they fit perfectly on each other then the original angle has been bisected.