

Geometric Constructions

1. Copying a segment

Copy the given segment.



Create the length 3AB



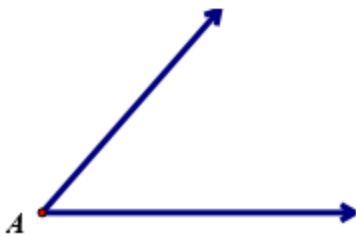
Create the length $AB - CD$



2. Bisect a segment (find the midpoint)



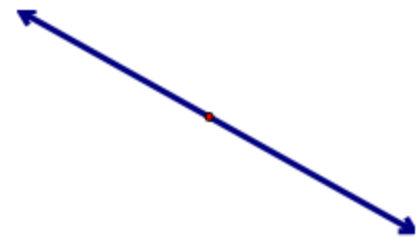
3. Copy an angle



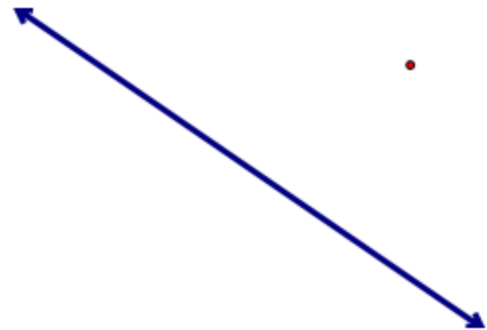
1. Construct the perpendicular bisector of a line segment



2. Construct a line perpendicular to a given segment through a point on the line.

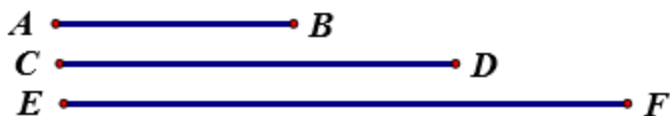


3. Construct a line perpendicular to a given line through a point not on the line.



COPYING A SEGMENT

1. Given \overline{AB} , \overline{CD} , & \overline{EF} . Use the copy segment construction to create the new lengths listed below.



3AB



CD + EF



2CD + 1AB

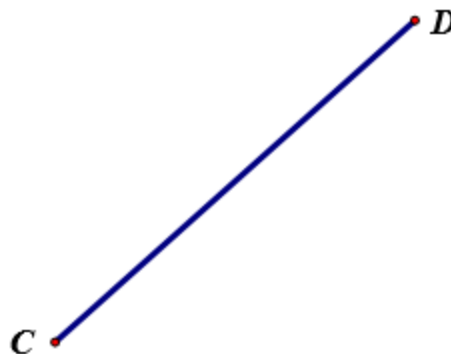


EF - CD



CONSTRUCTING A MIDPOINT

2. Given \overline{AB} & \overline{CD} . Use the midpoint construction to find the midpoint of \overline{AB} & \overline{CD}



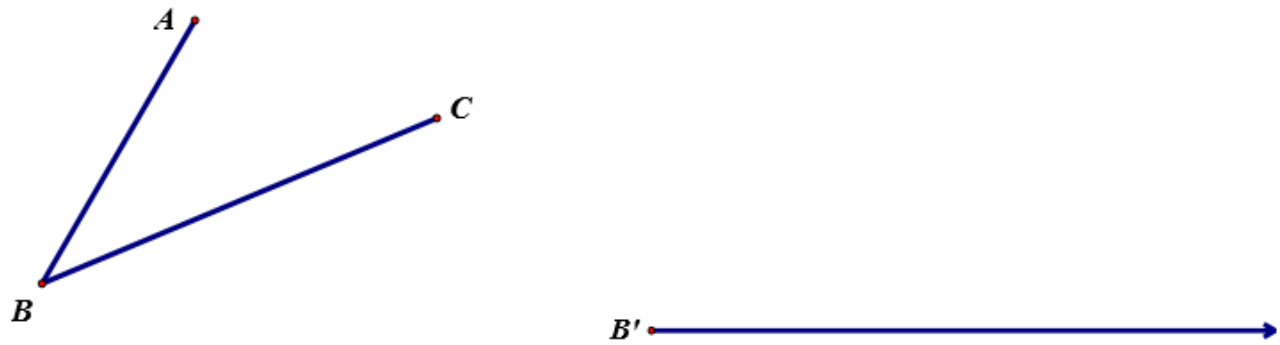
3. Use your midpoint construction to determine the exact length of $\frac{1}{4}EF$



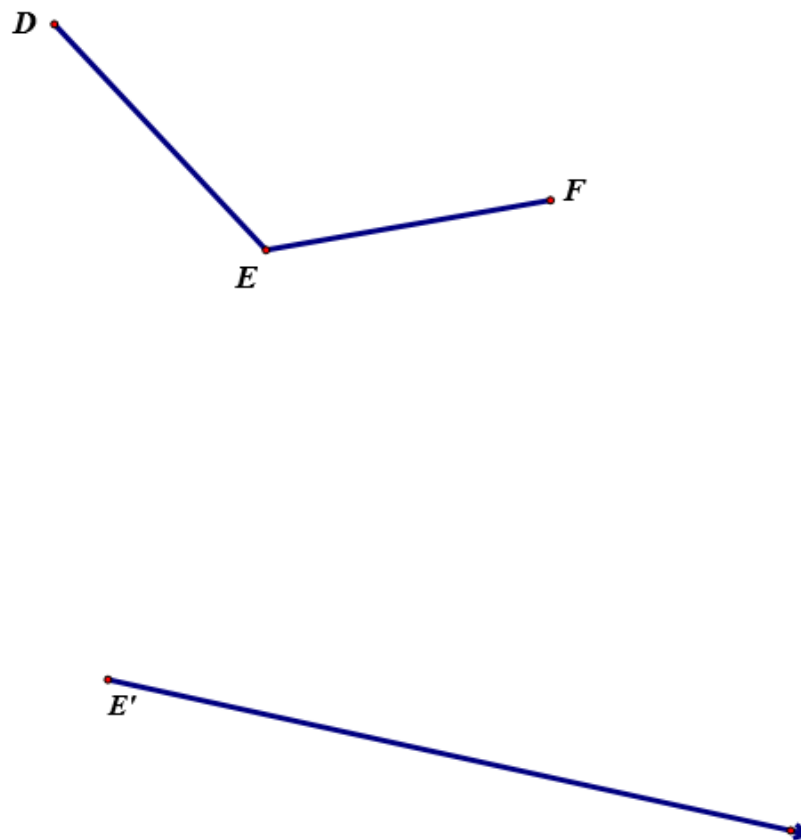
4. Bisect an angle



4. Given $\angle ABC$. Make a copy of $\angle ABC$, $\angle A'B'C'$.

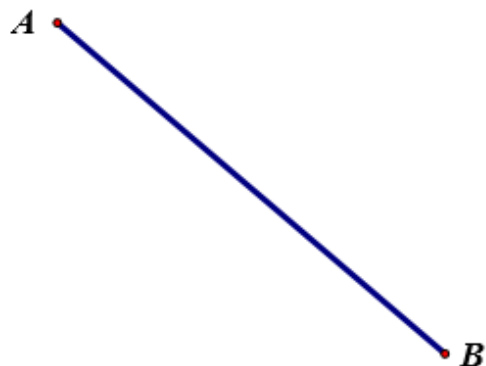


5. Given $\angle DEF$. Make a copy of $\angle DEF$, $\angle D'E'F'$.



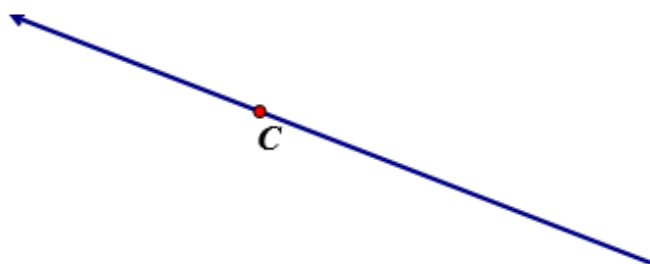
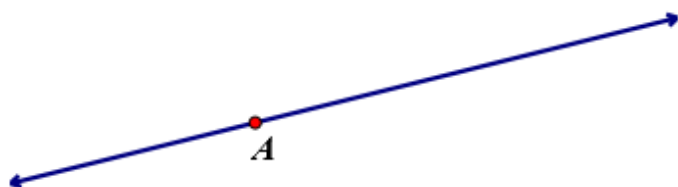
Constructing the Perpendicular Bisector (a \perp line through the midpoint of a segment).

1. Given \overline{AB} . Use the midpoint construction to construct the perpendicular bisector.



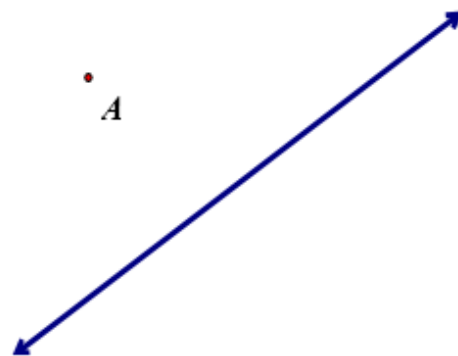
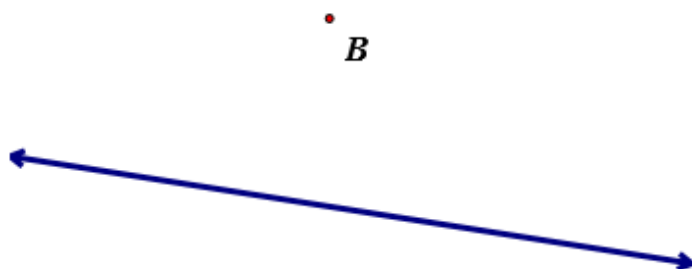
Construct the perpendicular line THROUGH A POINT ON THE LINE.

2. Work backwards from the midpoint construction.

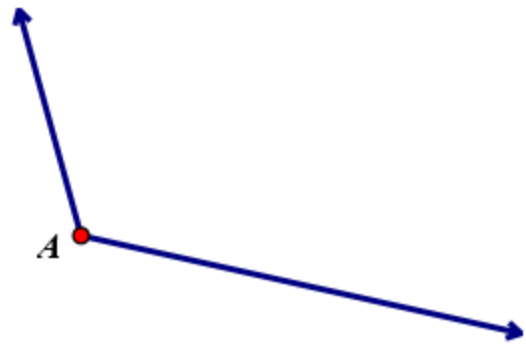
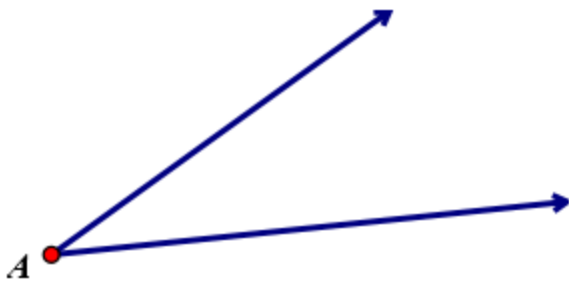


Construct the perpendicular line THROUGH A POINT not on THE LINE.

3. Work backwards through the midpoint construction.



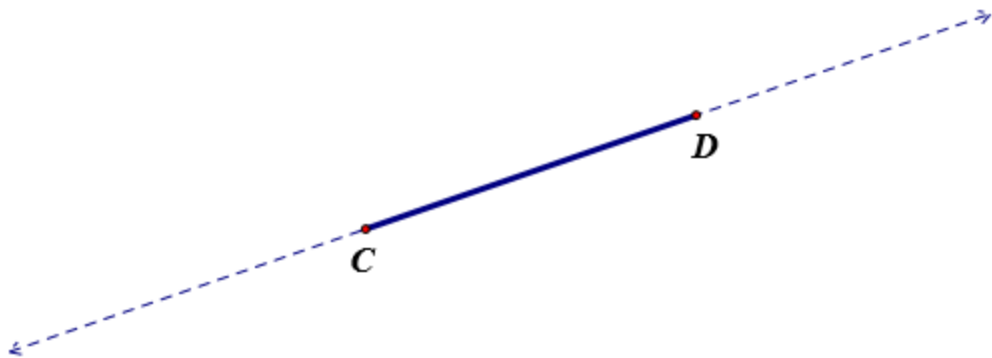
4. Given $\angle A$, construct the angle bisector, ray \overrightarrow{AD} .



5. Given sides of a rectangle. Construct the rectangle.
Hint - We need perpendicular lines through A and through B.



6. Given the side of a square. Construct the square.



Geometric Constructions

Name: _____ Block: ____

Construct congruent segments.

Construct a segment congruent to \overline{AB} .

1.



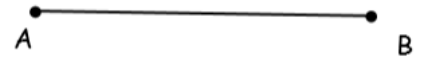
2.



3.



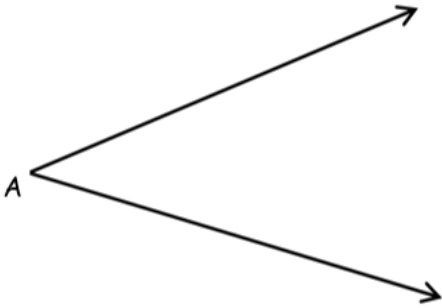
4.



Construct congruent angles

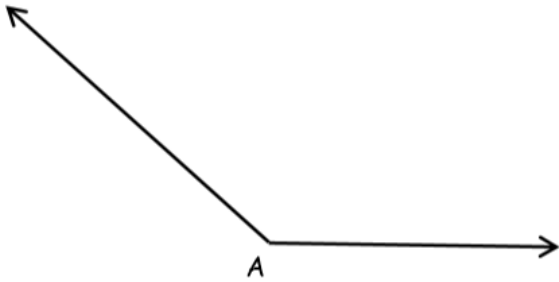
Construct an angle congruent to $\angle A$.

1.



Your construction here:

2.



Perpendicular bisector

1.



2.



3.

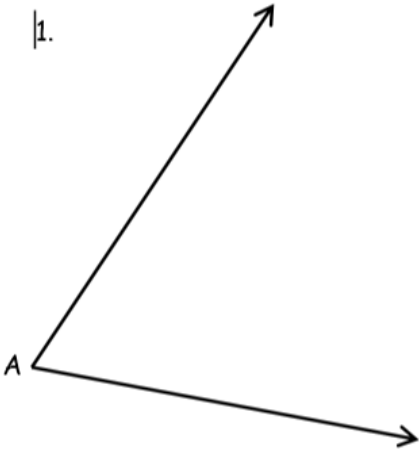


4.

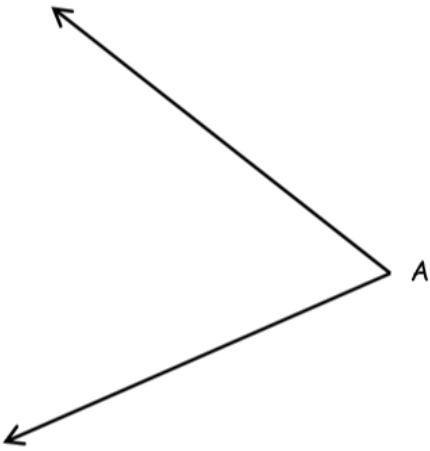


Angle Bisector

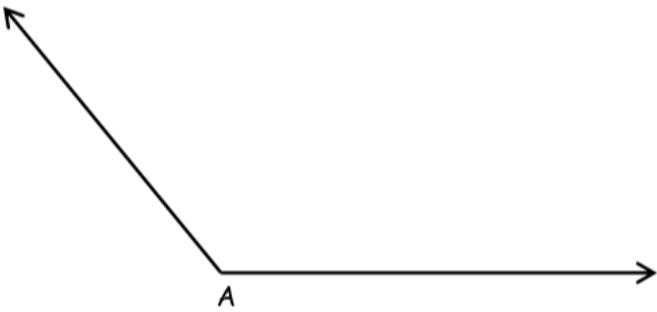
1.



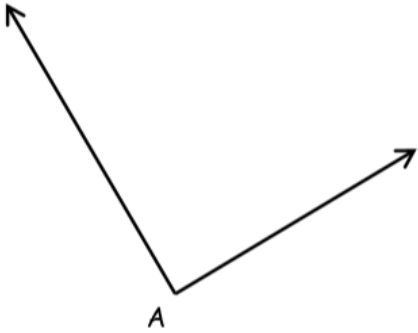
2.



3.



4.

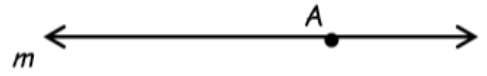


Perpendiculars, on a point on a line.

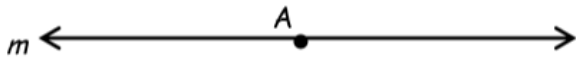
1.



2.



3.

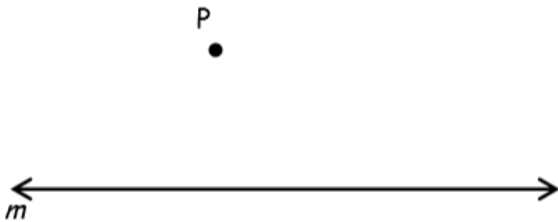


4.

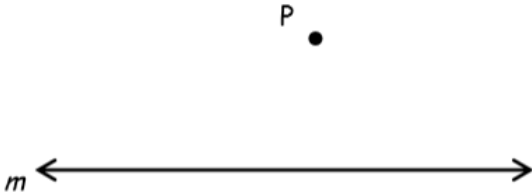


Perpendiculars, on a point NOT on a line.

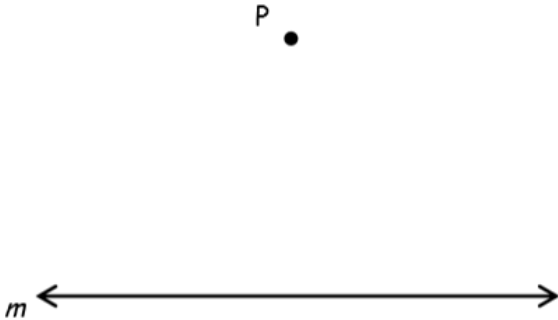
1.



2.



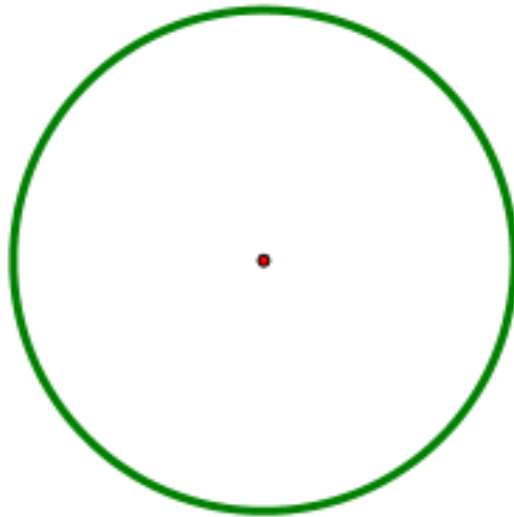
3.



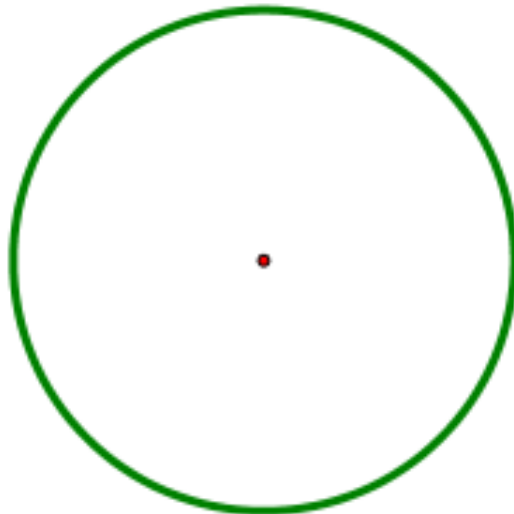
4.



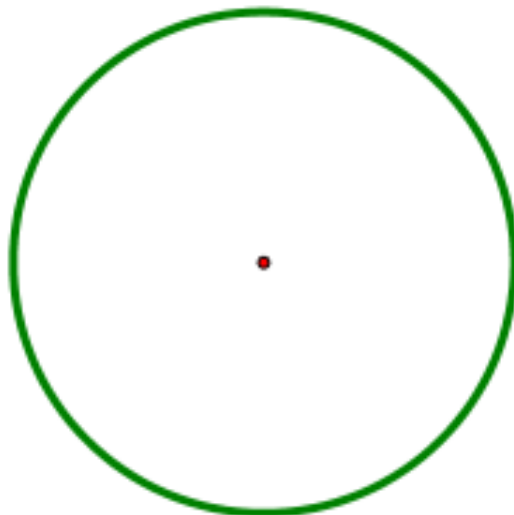
1. Construct an inscribed equilateral triangle.



2. Construct an inscribed square.

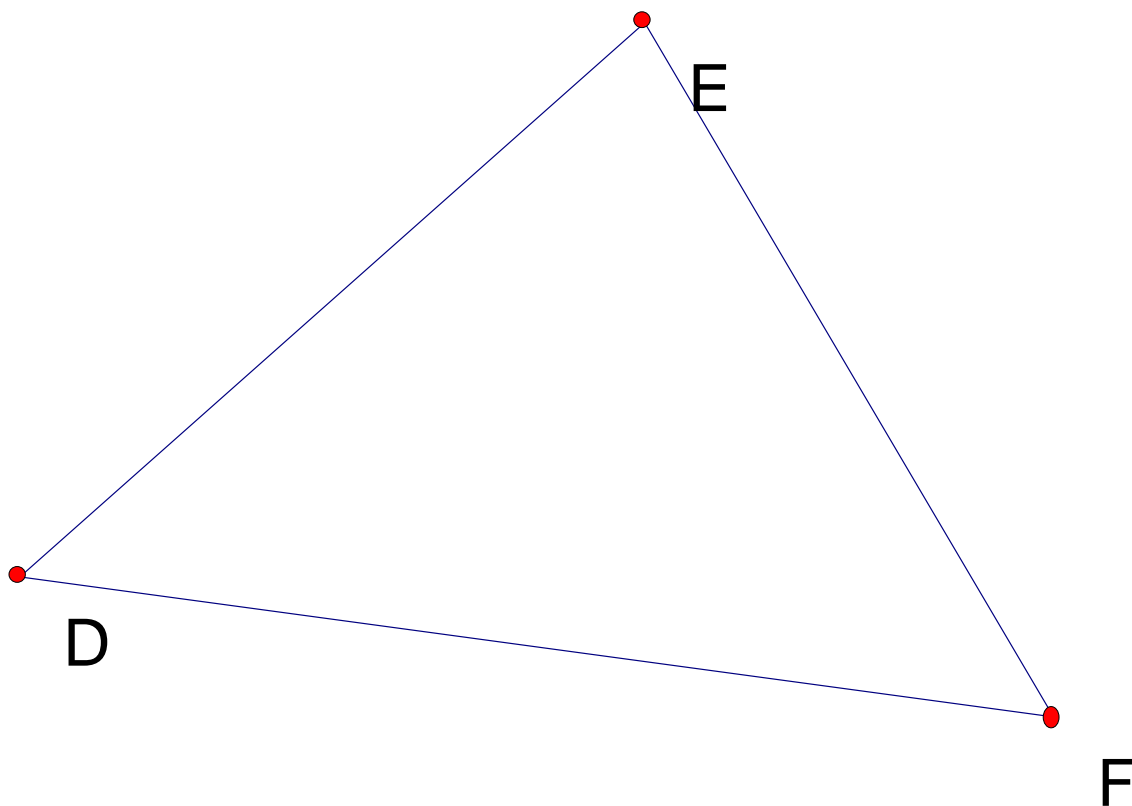


3. Construct an inscribed hexagon.



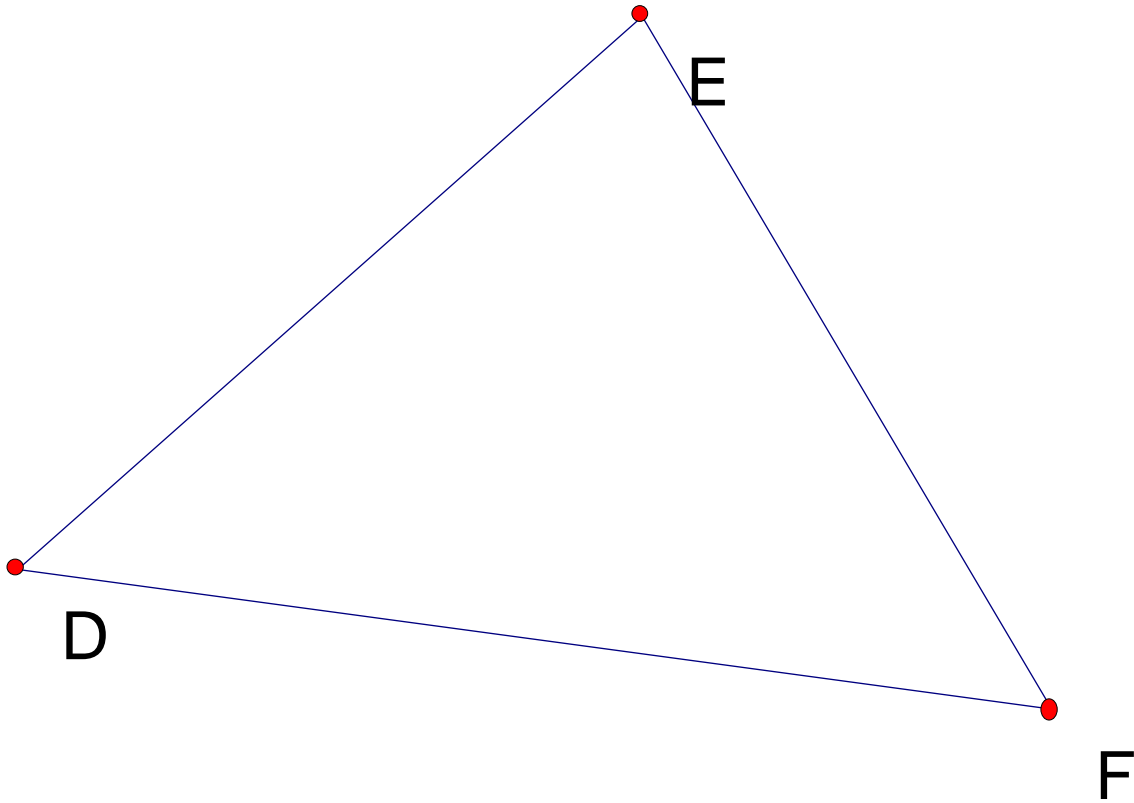
4. Circumscribe a Circle around a Triangle

- 1) Construct perpendicular bisectors for the sides of the triangle. They meet at the circumcenter.
- 2) Draw a circle with center at the circumcenter, and radius going out to a corner of the triangle. This circle will intersect all three vertices of the triangle, so it is the circumscribed circle.



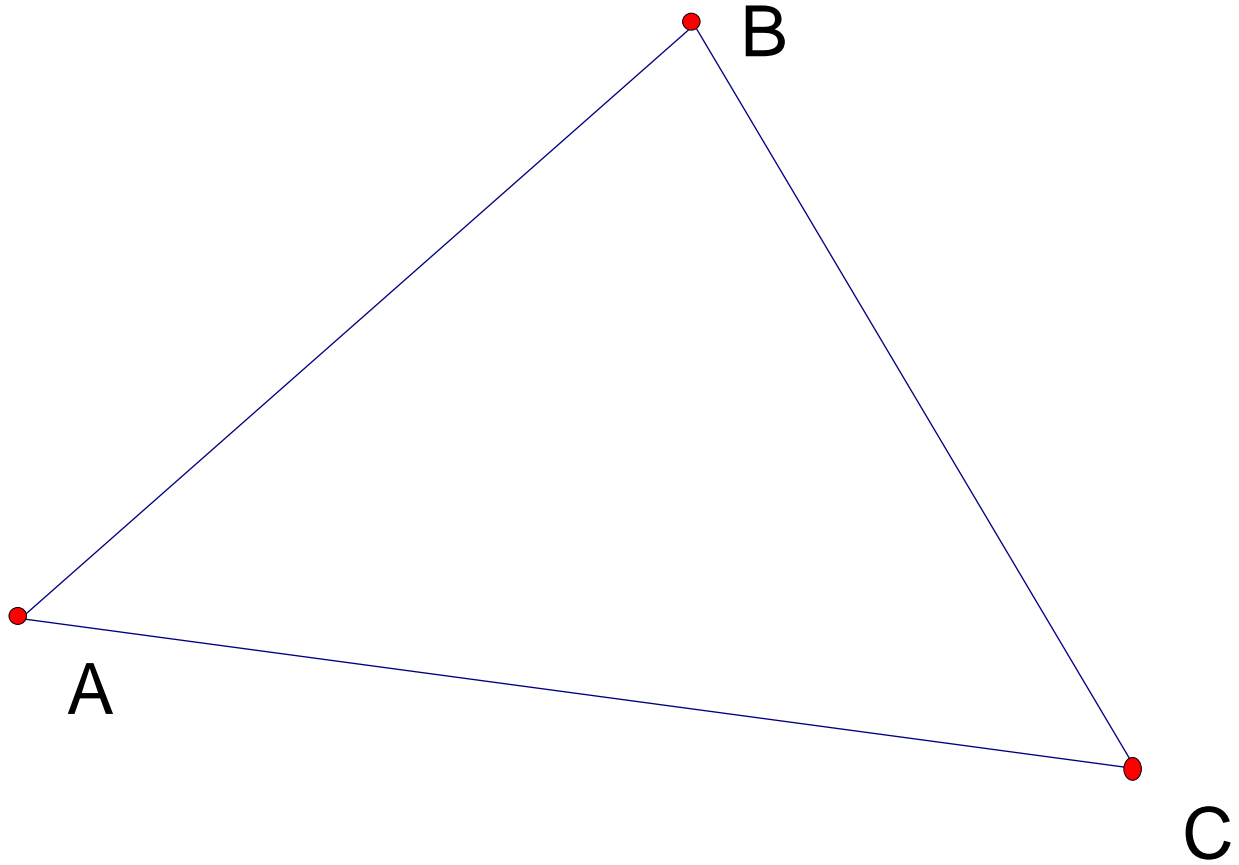
5. Inscribe a Circle within a Triangle

- 1) Construct the angle bisectors for the vertices of the triangle. They meet at the *incenter*.
- 2) Construct a perpendicular line segment from the incenter to any side of the triangle.
- 3) Draw a circle with center at the incenter, and radius extending out to the intersection of the perpendicular from (2) with the side.



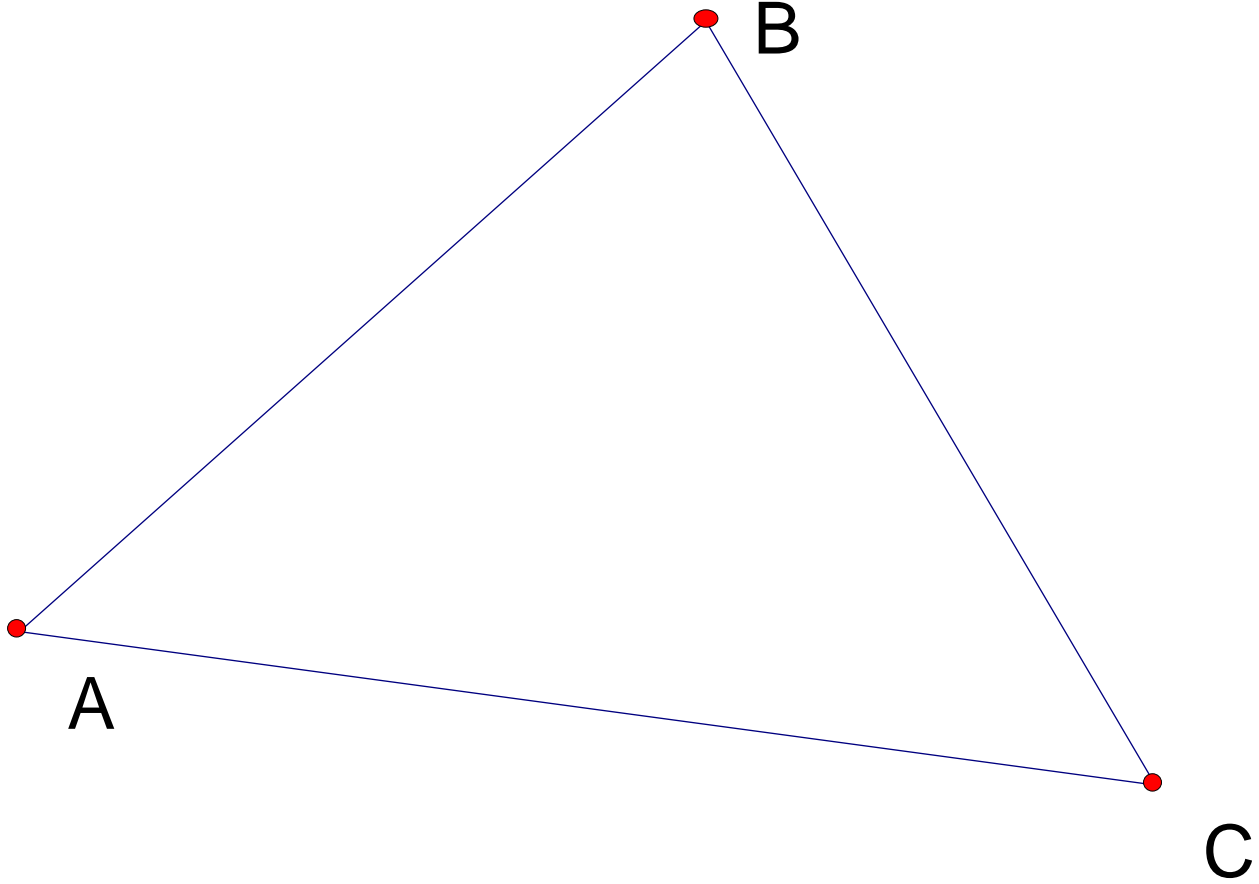
6. Orthocenter of a Triangle

- 1) Construct altitudes for each side of the triangle. Their intersection is the orthocenter.



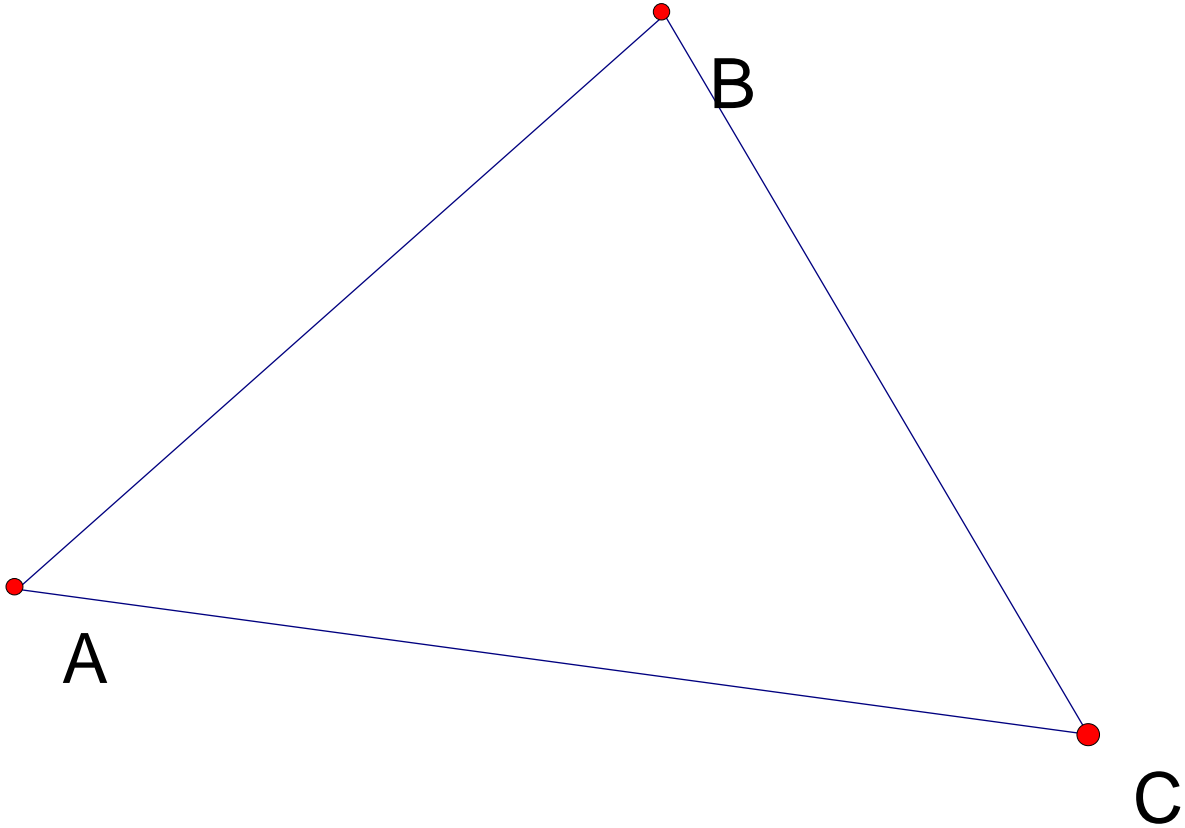
7. Centroid of a Triangle

- 1) Construct medians for the vertices of the triangle. Their intersection is the centroid!



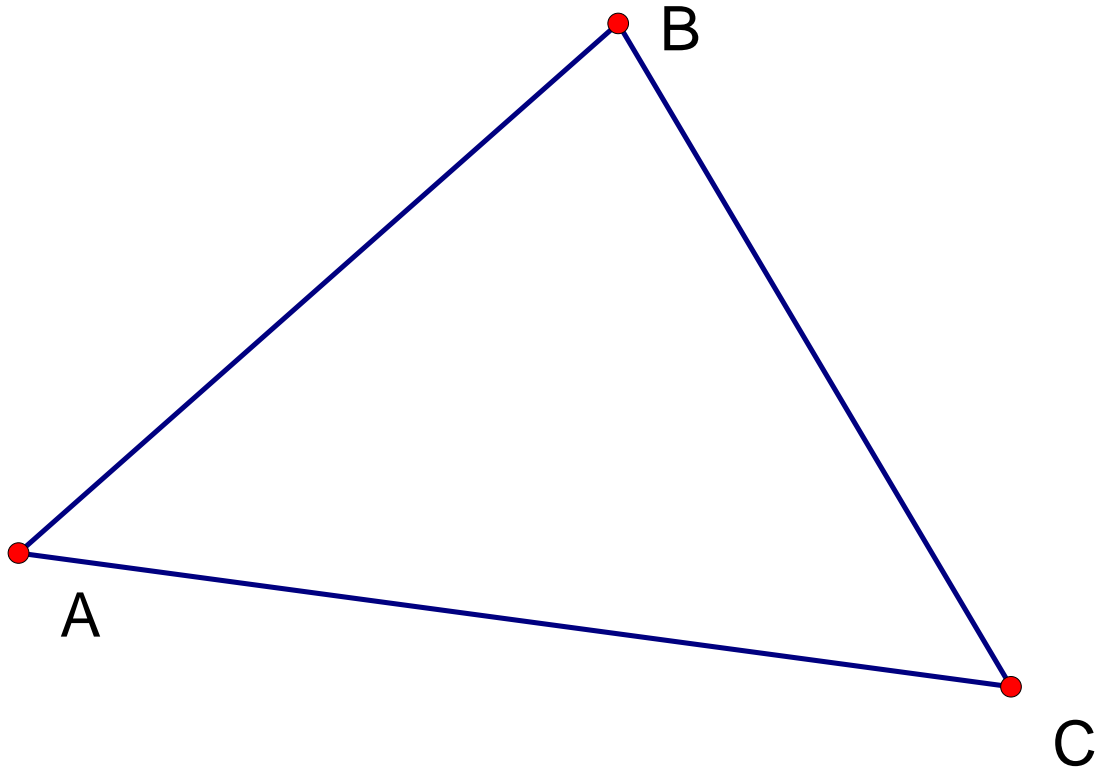
8. Median of a Triangle

- 1) Construct the midpoint of a side of the triangle.
- 2) Construct a line segment from the vertex opposite the side to the midpoint. That's the median!

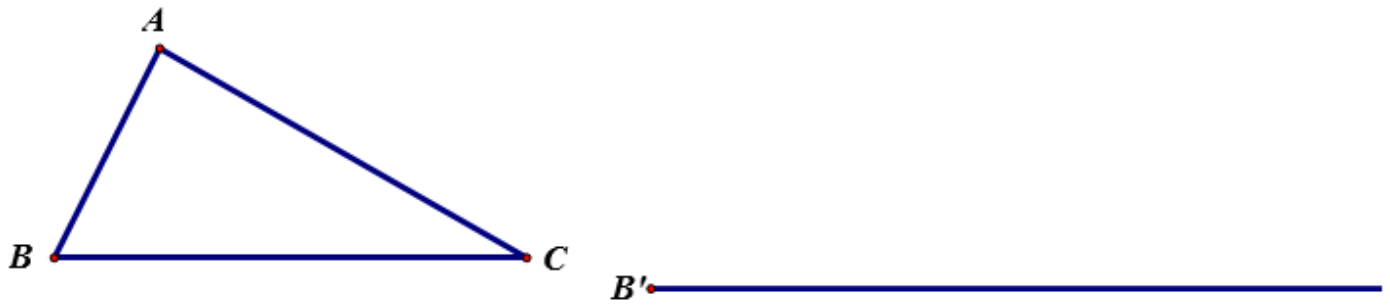


9. Midsegment of a Triangle

- 1) Construct midpoints for two sides of a triangle.
- 2) Draw a segment connecting the midpoints. That's the midsegment!



10. Given $\triangle ABC$, construct a copy of it, $\triangle A'B'C'$.



11. Circumscribe a circle about each rectangle.

