

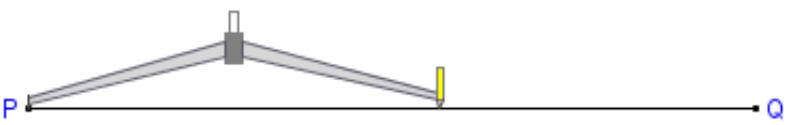
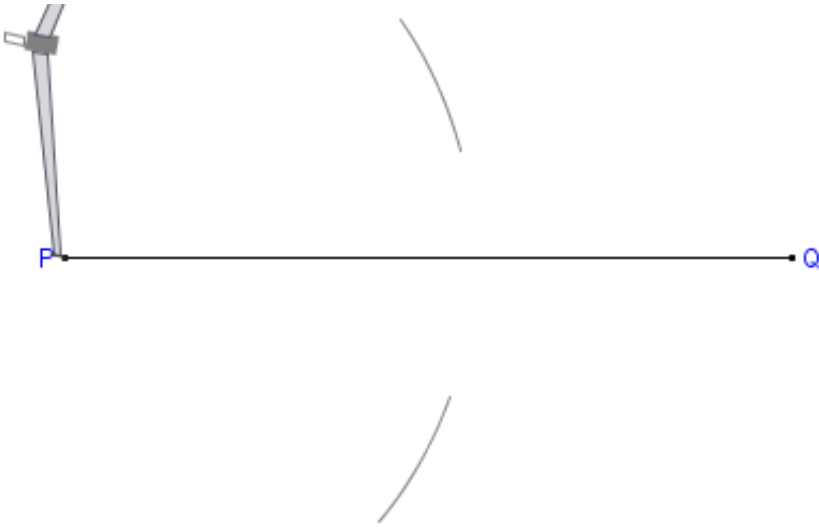
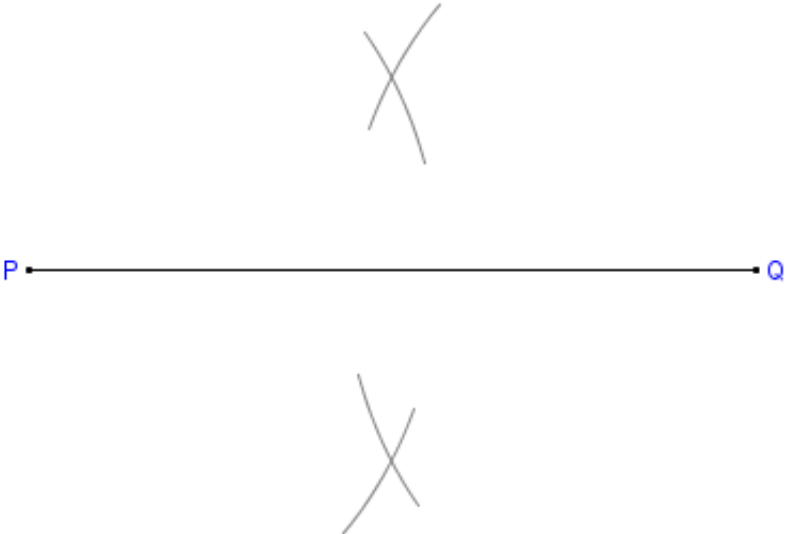
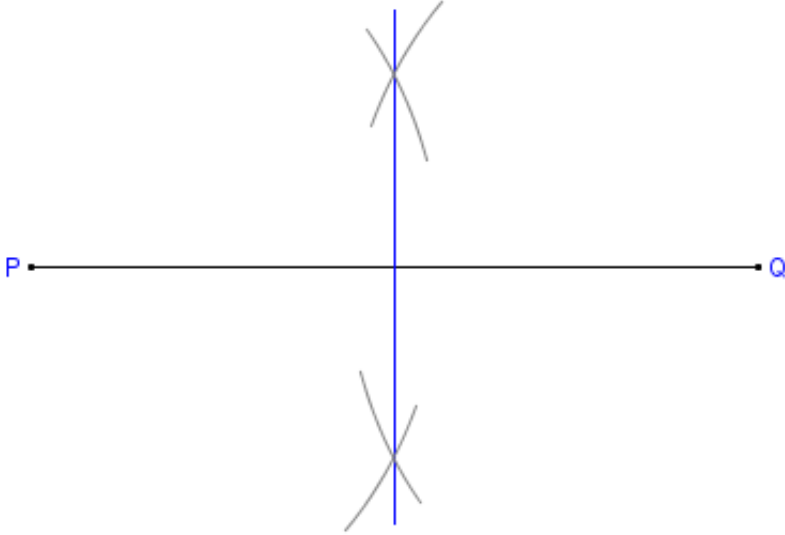
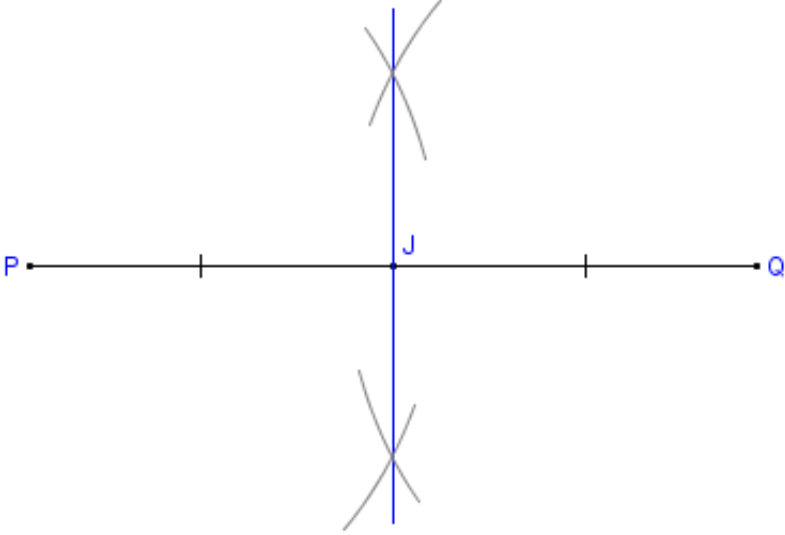


# Math Open Reference

## Constructing the perpendicular bisector of a line segment

	After doing this	Your work should look like this
	Start with a line segment PQ.	
1	Place the compasses on one end of the line segment.	
2	Set the compasses' width to a approximately two thirds the line length. The actual width does not matter.	
3	Without changing the compasses' width, draw an arc above and below the line.	
4	Again without changing the compasses' width, place the compasses'	

	<p>point on the the other end of the line. Draw an arc above and below the line so that the arcs cross the first two.</p>	
5	<p>Using a straightedge, draw a line between the points where the arcs intersect.</p>	
6	<p>Done. This line is perpendicular to the first line and bisects it (cuts it at the exact midpoint of the line).</p>	

## Other constructions pages on this site

[List of printable constructions worksheets](#)

### Lines

Introduction to constructions

Copy a line segment

Sum of n line segments

Difference of two line segments

Perpendicular bisector of a line segment

Perpendicular from a line at a point

Perpendicular from a line through a point

Perpendicular from endpoint of a ray

Divide a segment into n equal parts

Parallel line through a point (angle copy)

Parallel line through a point (rhombus)

Parallel line through a point (translation)

## **Angles**

Bisecting an angle

Copy an angle

Construct a  $30^\circ$  angle

Construct a  $45^\circ$  angle

Construct a  $60^\circ$  angle

Construct a  $90^\circ$  angle (right angle)

Sum of n angles

Difference of two angles

Supplementary angle

Complementary angle

Constructing  $75^\circ$   $105^\circ$   $120^\circ$   $135^\circ$   $150^\circ$  angles and more

## **Triangles**

Copy a triangle

Isosceles triangle, given base and side

Isosceles triangle, given base and altitude

Isosceles triangle, given leg and apex angle

Equilateral triangle

30-60-90 triangle, given the hypotenuse

Triangle, given 3 sides (sss)

Triangle, given one side and adjacent angles (asa)

Triangle, given two angles and non-included side (aas)

Triangle, given two sides and included angle (sas)

Triangle medians

Triangle midsegment

Triangle altitude

Triangle altitude (outside case)

### **Right triangles**

Right Triangle, given one leg and hypotenuse (HL)

Right Triangle, given both legs (LL)

Right Triangle, given hypotenuse and one angle (HA)

Right Triangle, given one leg and one angle (LA)

### **Triangle Centers**

Triangle incenter

Triangle circumcenter

Triangle orthocenter

Triangle centroid

### **Circles, Arcs and Ellipses**

Finding the center of a circle

Circle given 3 points

Tangent at a point on the circle

Tangents through an external point

Tangents to two circles (external)

Tangents to two circles (internal)

Incircle of a triangle

Focus points of a given ellipse

Circumcircle of a triangle

### **Polygons**

Square given one side

Square inscribed in a circle

Hexagon given one side

Hexagon inscribed in a given circle

Pentagon inscribed in a given circle

### **Non-Euclidean constructions**

Construct an ellipse with string and pins

Find the center of a circle with any right-angled object