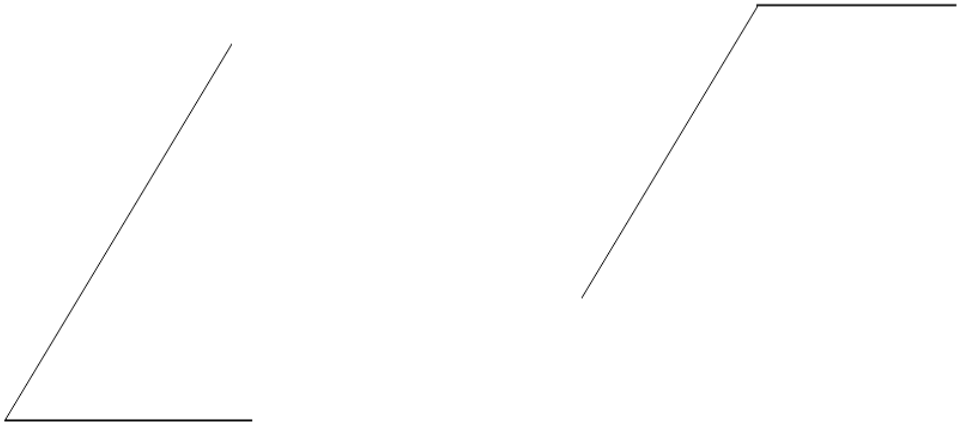
The Prescribed Constructions

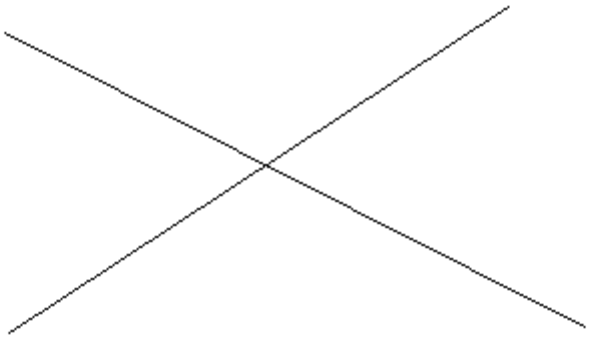
No	Construction		Done
1.	Bisector of a given angle, using only compass and straight edge.	HL	
2.	Perpendicular bisector of a segment, using only compass and straight edge.	HL	
3.	Line perpendicular to a given line l, passing through a given point not on l.	HL	
4.	Line perpendicular to a given line l, passing through a given point on l.	HL	
5.	Line parallel to given line, through given point.	HL	
6.	Division of a segment into 2, 3 equal segments, without measuring it.	HL	
7.	Division of a segment into any number of equal segments, without measuring it.	HL	
8.	Line segment of given length on a given ray.	HL	
9.	Angle of given number of degrees with a given ray as one arm.	HL	
10.	Triangle, given lengths of three sides.	HL	
11.	Triangle, given SAS data.	HL	
12.	Triangle, given ASA data.	HL	
13.	Right-angled triangle, given the length of the hypotenuse and one other side.	HL	
14.	Right-angled triangle, given one side and one of the acute angles (several cases).	HL	
15.	Rectangle, given side lengths.	HL	
16.	Circumcentre and circumcircle of a given triangle, using only straightedge and compass.	OL	
17.	Incentre and incircle of a given triangle, using only straight-edge and compass.	OL	
18.	Angle of 60°, without using a protractor or set square.	FL	
19.	Tangent to a given circle at a given point on it.	FL	
20.	Parallelogram, given the length of the sides and the measure of the angles.	FL	
21.	Centroid of a triangle.	OL	
22.	Orthocentre of a triangle.	HL	

1. Bisect a given angle

1. Bisect the two angles below

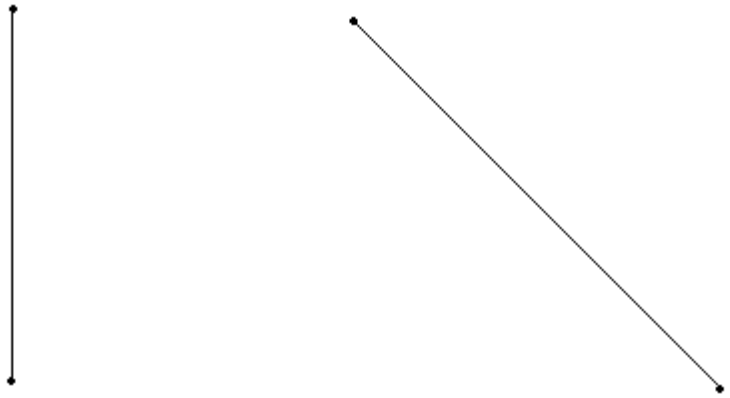


2. Challenge Problem: Bisect all 4 angles, using the fewest arcs and lines. (record: 4 arcs 2 lines)



2. Perpendicular bisector of a segment

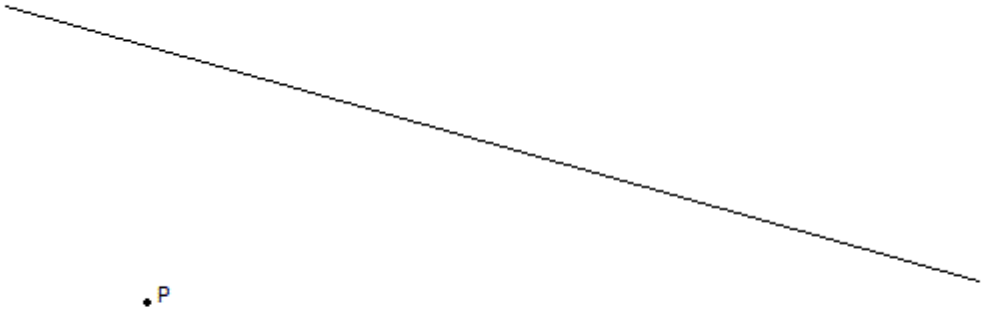
1. Draw the perpendicular bisector of both of the two lines below



2. Construct the four perpendicular bisectors of the sides of the rectangle below, using the fewest arcs and lines. (The record: 3 arcs, 2 lines)

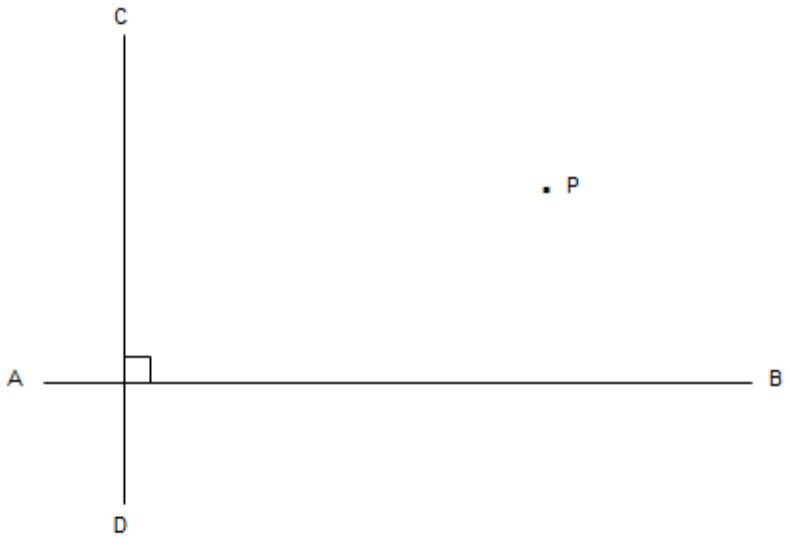
3. Perpendicular line from a point on a line

1. Construct a line perpendicular to the one below that passes through the point P



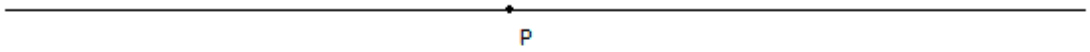
2. (a) Construct a line perpendicular to AB through P, and another line perpendicular to CD also through P

   (b) What is the name of the resulting 4-sided shape? Measure its side lengths with a ruler and calculate its area.



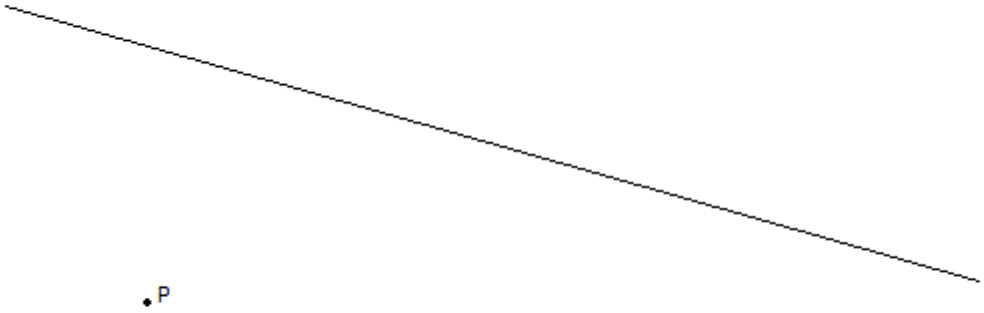
4. Perpendicular line from a point on the line

1. Construct a line perpendicular to the ones below that passes through the point P

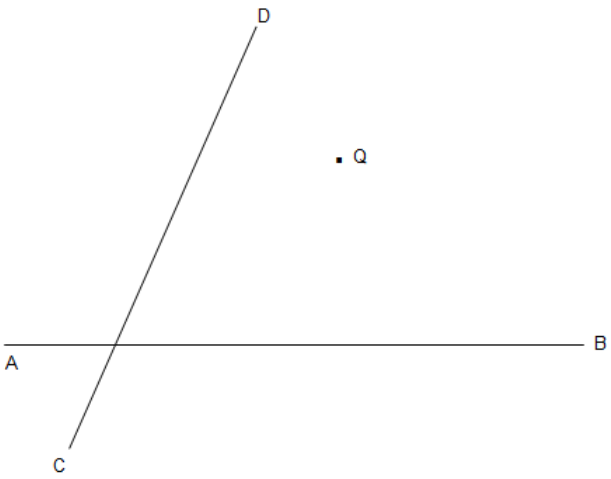


5. Line parallel to a given line

1. Construct a line parallel to the one below that passes through the point P



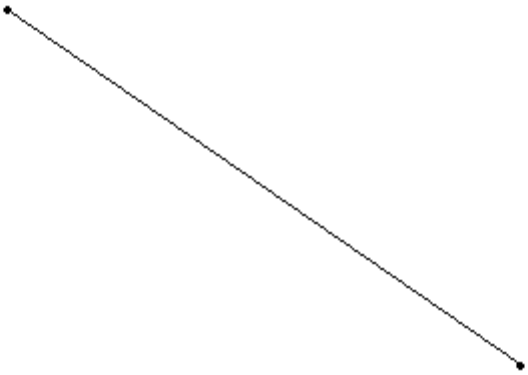
2. (a) Construct a line parallel to AB through Q, and another line parallel to CD also through Q



6/7. Division of a line segment

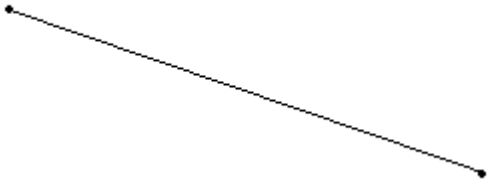
1. Divide the line segment below into 3 equal parts

2. Divide the line segment below into 7 equal parts.

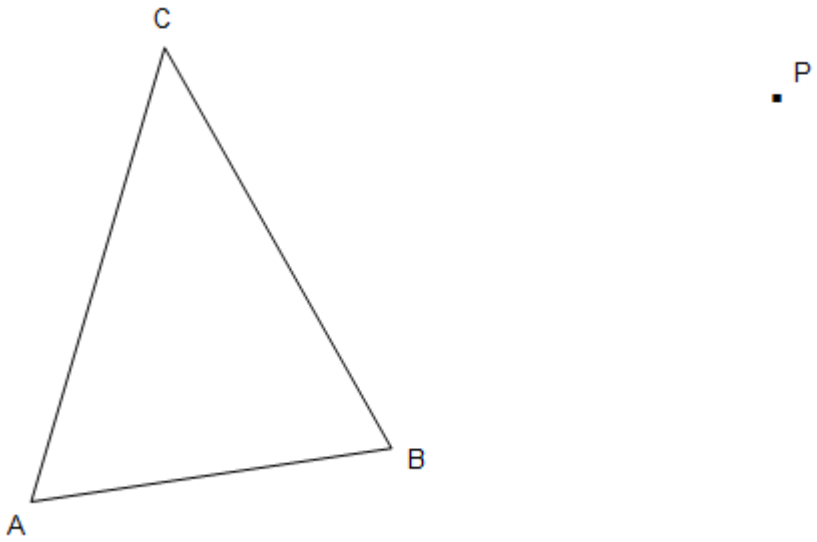


8. Line Segment

1. Construct a copy of the line segment below.

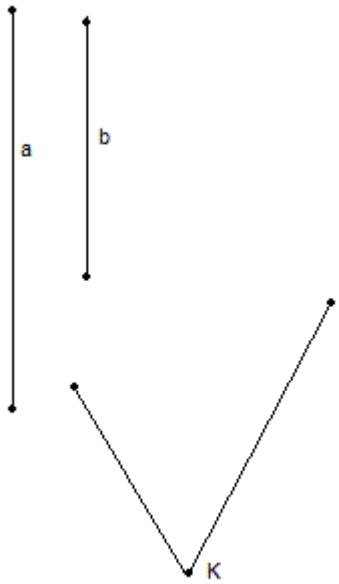


2. Construct a copy of the line segment AB from the triangle. The copy should have one endpoint at P.



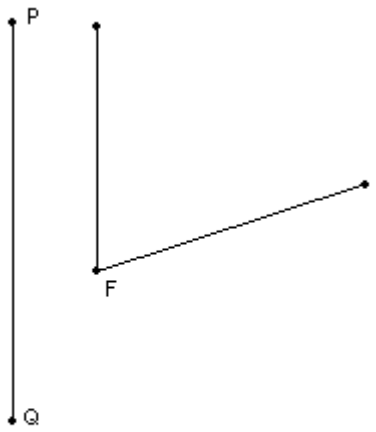
11. Triangle (SAS)

1. Construct a triangle has two sides congruent to the given line segments a and b and where the included angle is equal in measure to the angle K.



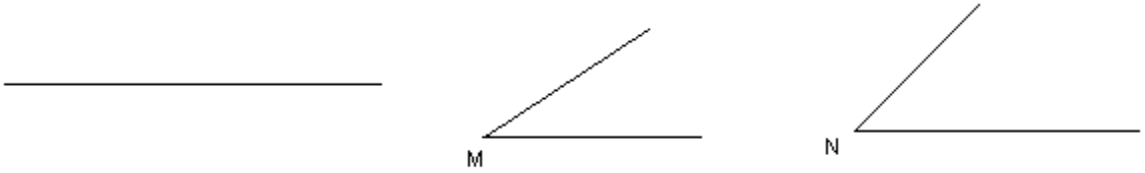
2. (a) Construct a triangle which has two sides both equal to the given line segment PQ, and where the angle between them has the same measure as the angle F.

   (b) What is the exact name of the type of triangle drawn in this construction?

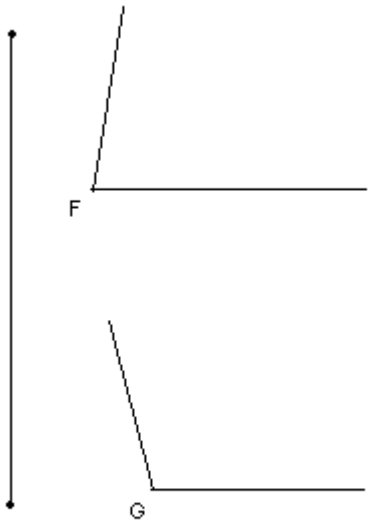


12. Triangle (ASA)

1. Construct a triangle which has one side equal to the given line segment and where the angles at each end of that segment are equal in measure to the angles M and N.

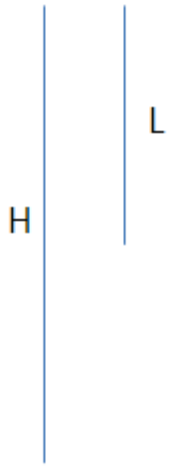


2. Construct a triangle which has one side equal to the given line segment and where the angles at each end of that segment are equal in measure to the angles F and G. Explain any problem you may have with the construction.



13. Right-angled triangle, given the hypotenuse and one other side

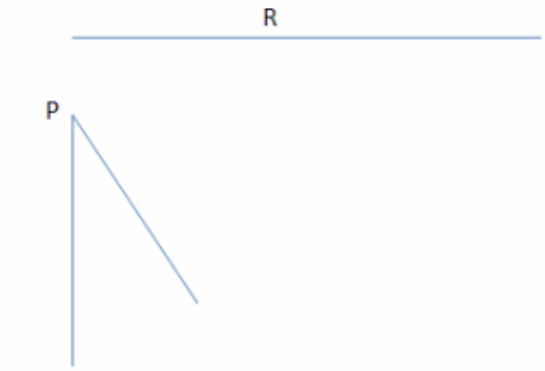
1.Construct a right triangle with the leg L and hypotenuse H:



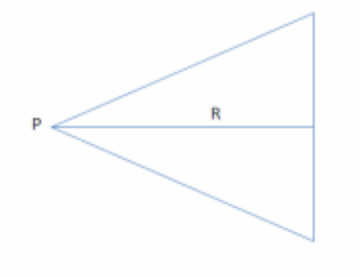
2. Repeat the above with the leg and hypotenuse given. If any problem arises in the construction, explain the cause of the problem.

14. Right-angled Triangle, one side and one acute angle

1.Construct a right triangle PQR with the leg R, and angle P. Make angle Q be the right angle.

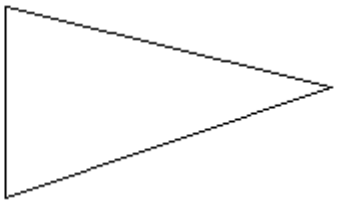


2. Draw two triangles with a common leg PQ using the givens above. It should look like the figure on the right. By drawing them both, you can cut down on steps. What is the smallest number of arcs and lines needed to do this?

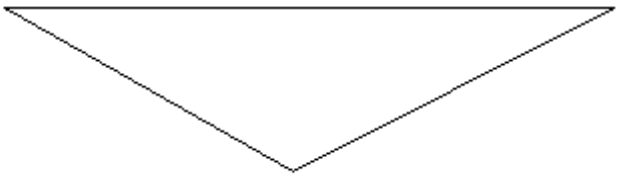


16. Circumcentre

1. Construct the circumcenter and circumcircle of the triangle below.

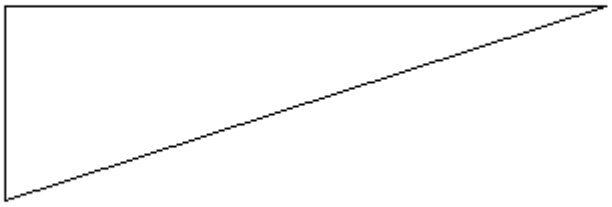


2. Construct the circumcenter and circumcircle of the triangle below.

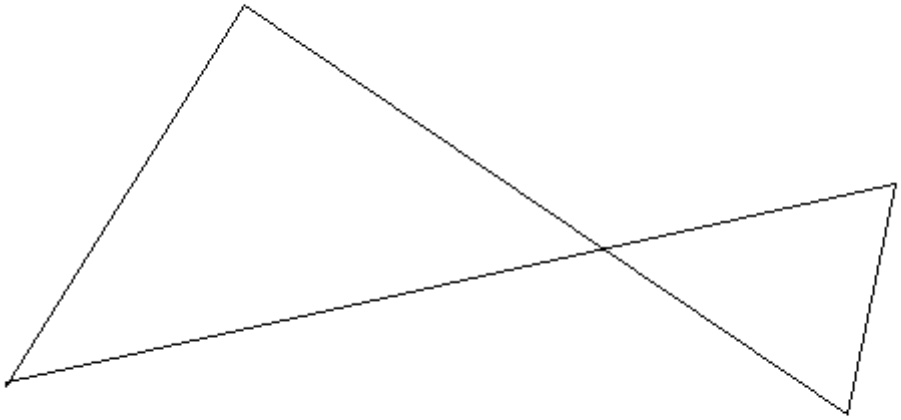


17. Incentre

1. Construct the incenter and incircle of the triangle below.



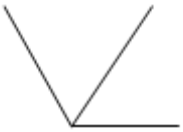
2. (a) Construct the incenter and incircle of both the triangles below.
   (b) Draw a line between the two incenters. What do you notice about the line? Explain why this is.



18. Construct an angle of 60°

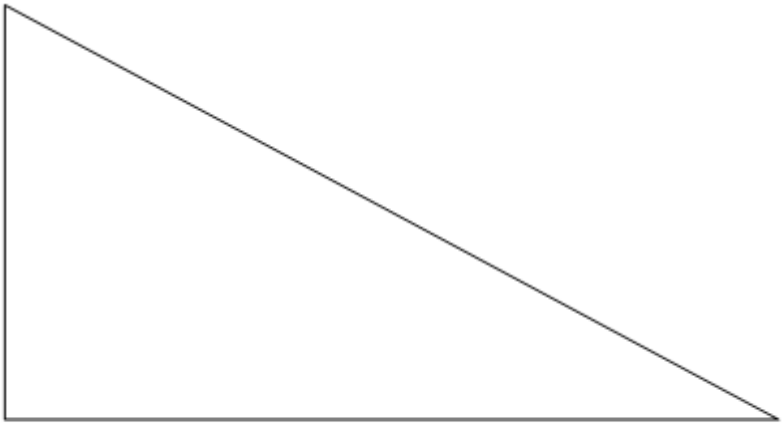
1. Construct a 60° angle with its vertex at the point P

2. Perform the construction twice to create a 120° angle from two 60° angles that are adjacent (share a side) as in the example:



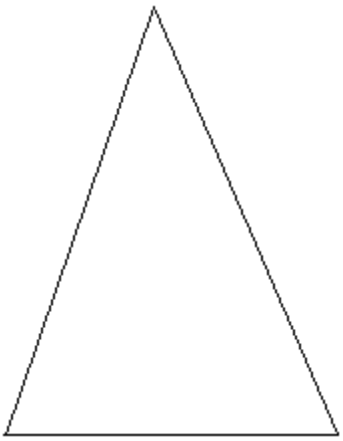
21. Centroid

1. Construct the centroid of the triangle below.



22. Orthocentre

1. Construct the orthocenter of the triangle below



2. Construct the orthocenter of the triangle below. Note: the orthocenter is outside this triangle.