Hands-on Lwr. 2ndry Maths

Name : ..... No : .....

Class : .....

Date : .....

CENTRE of a TRIANGLE : Worksheet 1

(You will need a Compass and Straight Edge for this worksheet)

There are four well known centres of a triangle which can be found with a Compass and Straight Edge :

1. The Incentre : the intersection of the angle bisectors
2. The Circumcentre : the intersection of the perpendicular bisectors
3. The Orthocentre : the intersection of the altitudes
4. The Centroid : the intersection of the medians

As well, there is the Medial Triangle, which uses the midpoints of each side

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The Incentre : intersection of the angle bisectors

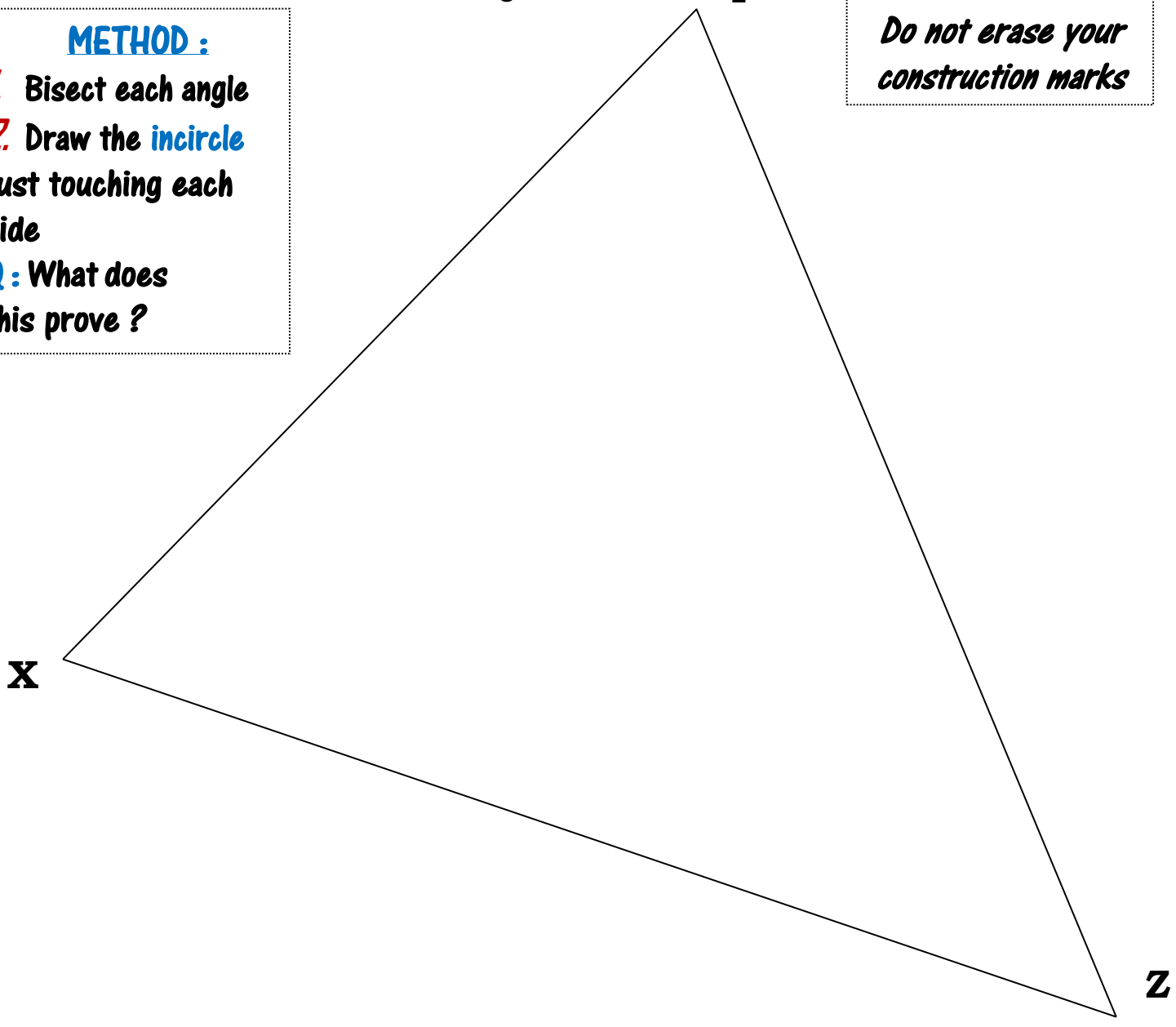
METHOD :

1. Bisect each angle
2. Draw the incircle just touching each side

Q : What does this prove ?

NOTE

Do not erase your construction marks



The **Circumcentre** : intersection of the perpendicular bisectors

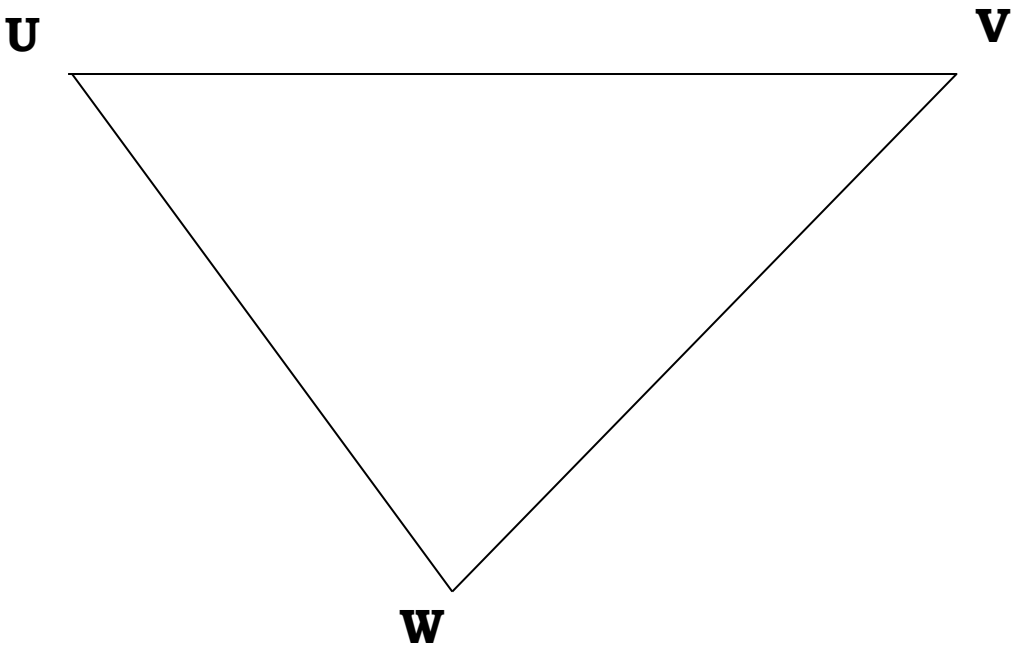
METHOD :

1. Construct perpendicular bisectors on each side
2. Form the circumcircle (centre at circumcentre) just touching each vertex

Q : What does this prove ?

NOTE

Do not erase your construction marks



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CENTRE of a TRIANGLE : *Worksheet 2*

You will need a Compass and Straight Edge to do this

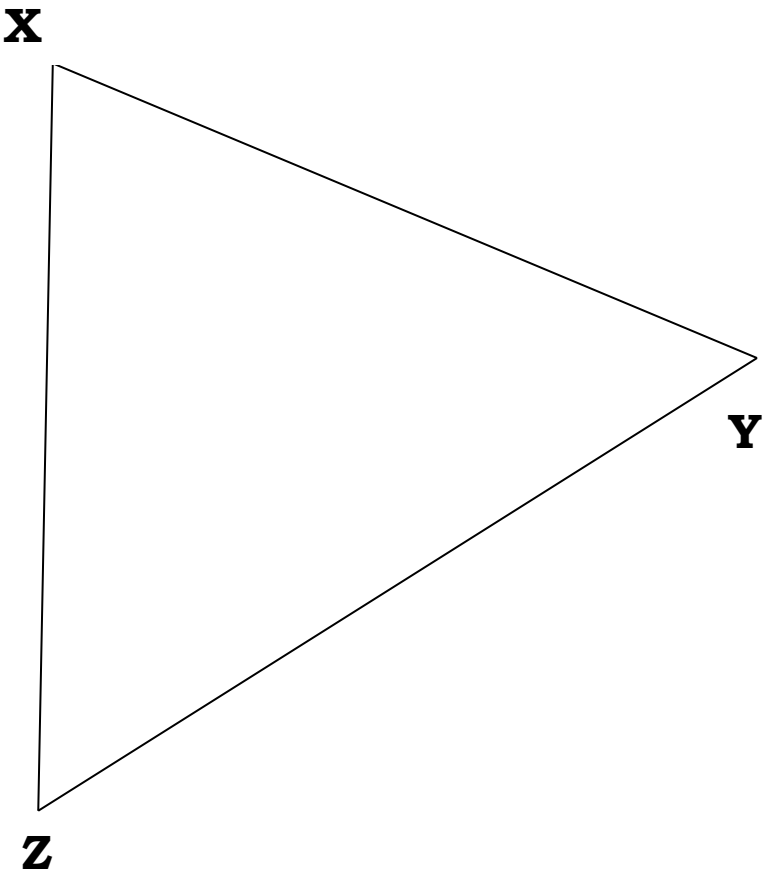
The Orthocentre : intersection of the altitudes

METHOD :

Drop perpendiculars from each vertex to their opposite sides

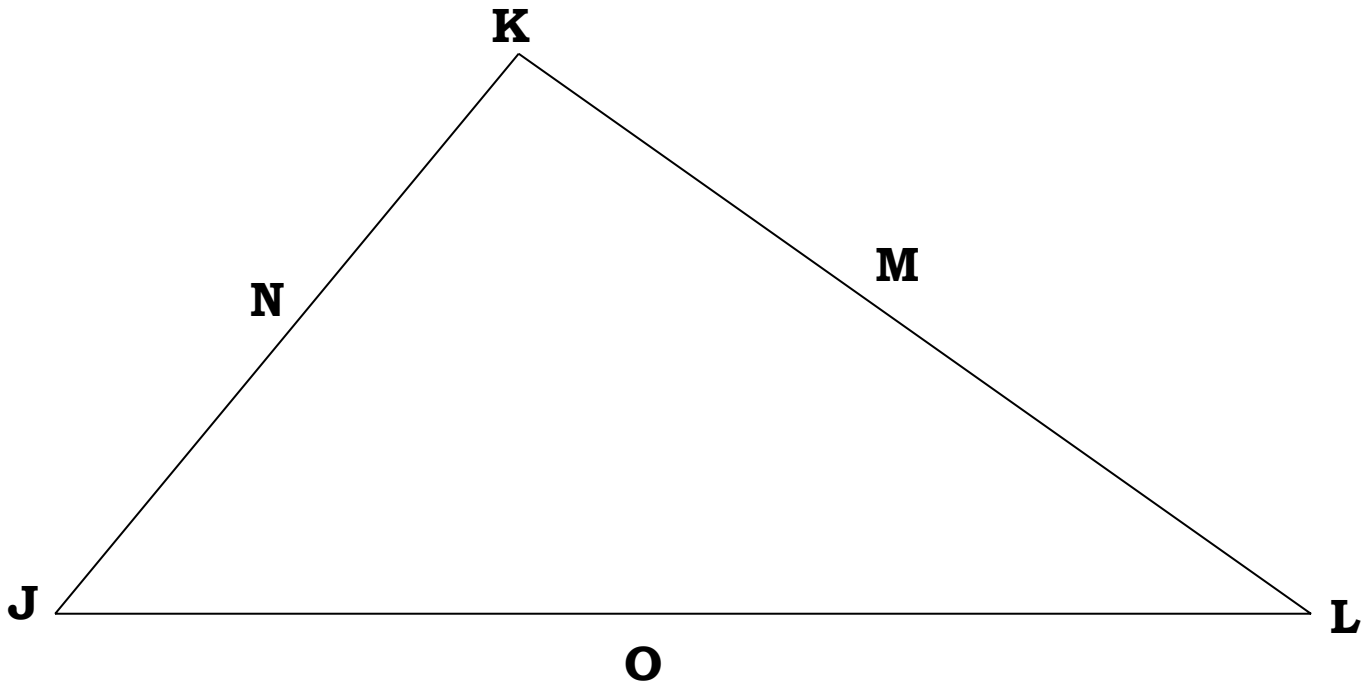
NOTE :

Do not erase your construction marks



The Centroid : intersection of the medians.

METHOD : By construction, find the midpoints and draw the medians



(i) The Centroid forms 6 smaller triangles of equal area

(ii) The medians are cut 1 : 2

(iii) The Centroid is the centre of mass *i.e.* the centre of balance

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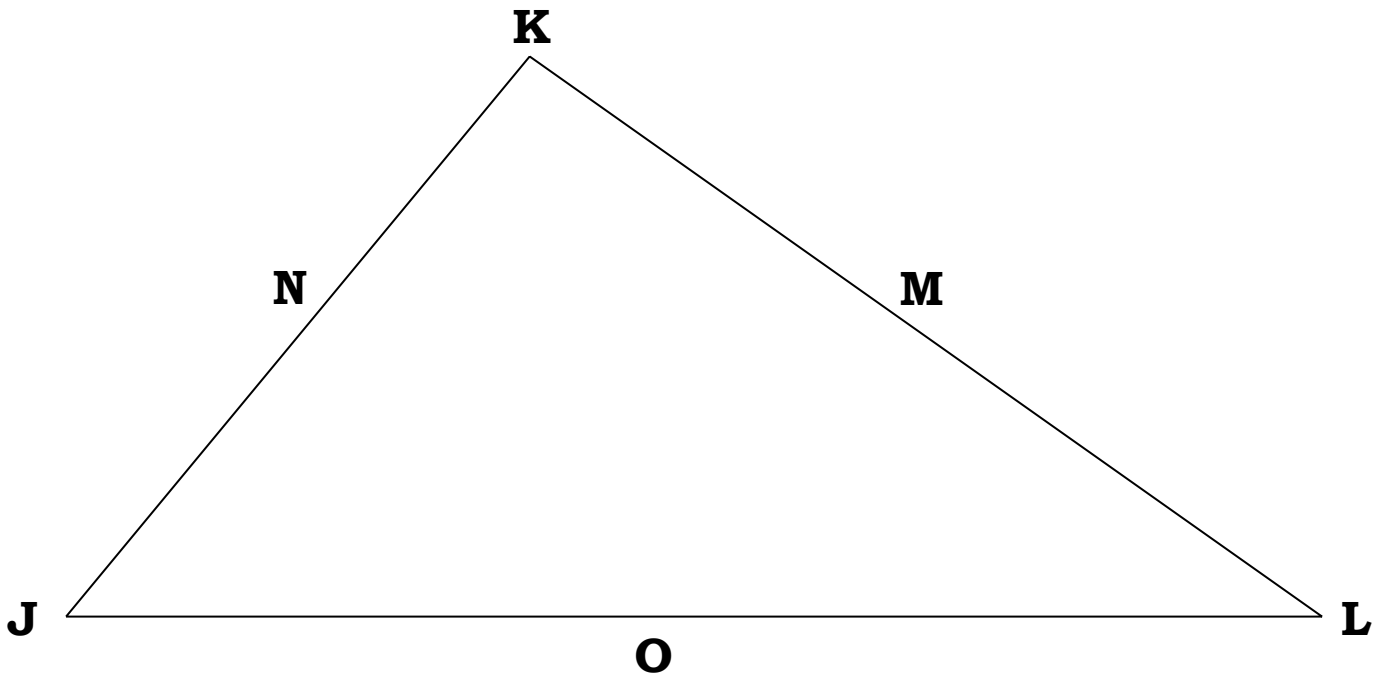
CENTRE of a TRIANGLE : *Worksheet 3*

You will need a Compass and Straight Edge to do this

The Medial Triangle : *METHOD : Join the midpoints to form a triangle*



By the Triangle Midpoint Theorem, each new line is ½ the length of the side which subtends the same angle, and is parallel to it. So the large triangle is similar to the medial triangle in a side to side ratio of 2 : 1 which means it has an area to area ratio of 4 : 1

Further, the 3 triangles formed are all congruent to the medial triangle
Use hash marks (/ and /, // and //) to mark the equal sides

Swiss Mathematician Leonard Euler (1707 – 1783)

The Euler Line : *METHOD : Find the Orthocentre, Circumcentre and Centroid of this obtuse triangle and draw the Euler Line*