Constructing a unique quadrilateral (Square)

The methods for constructing a square are precisely the same as for a rectangle but, in the case of a square, all four sides are equal

(a) Using rulers and compasses only, construct the square EFGH, with EF=10cm

Show all construction clearly

(b) Measure and state the length of diagonals EG and FH

State your observation

(c) Let the point of intersection of diagonals be represented by X.

Measure and state the length of:

(i) EX (ii) FX (iii) GX (iv) HX (v) State the angle EXF

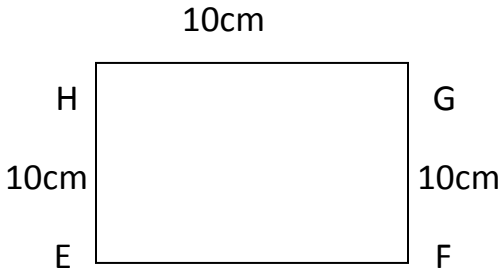
State your observation

(d) Estimate

i) Triangles EXF and GXH

ii) Triangles EXH and GXF

State your observations

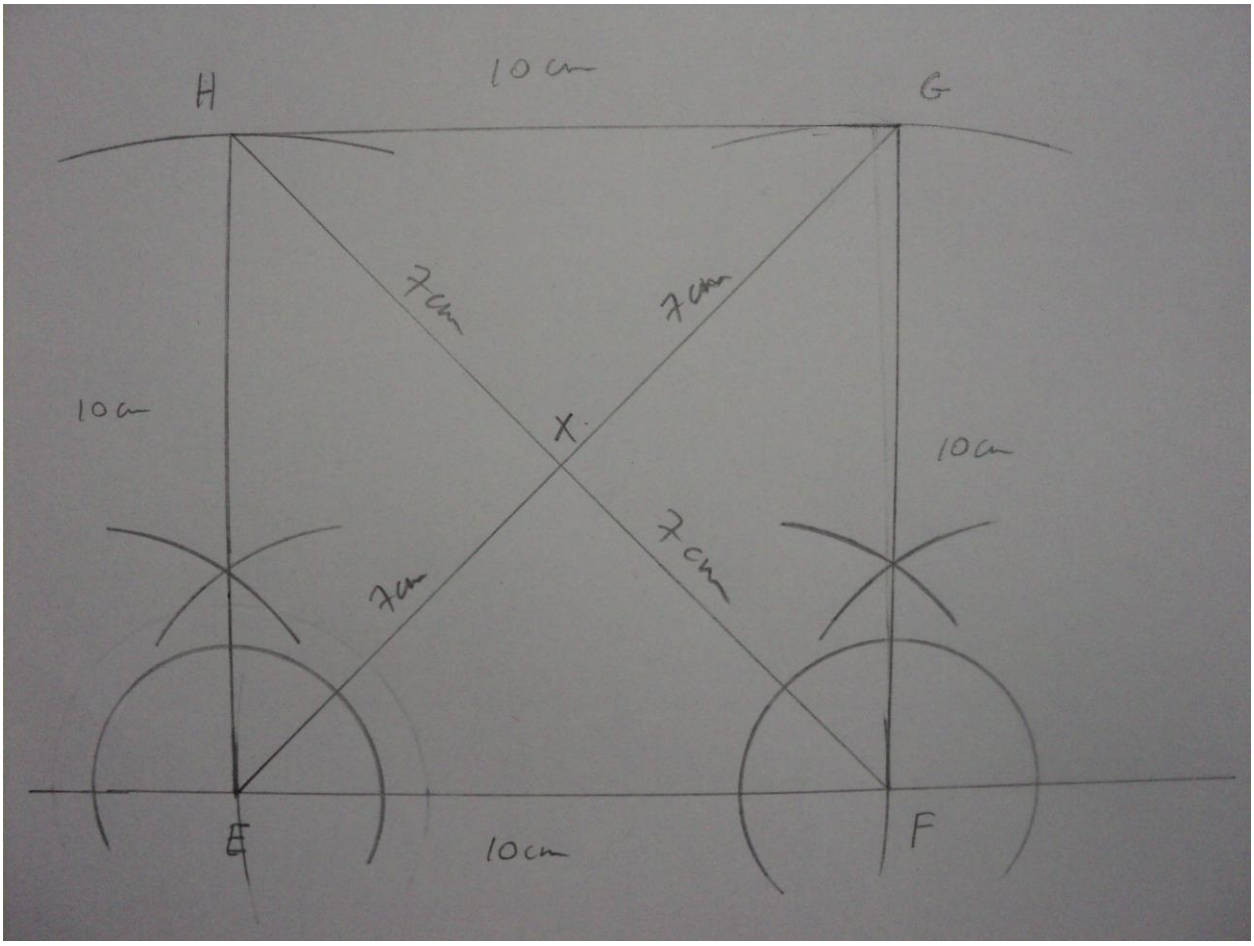


Sketch

Above is a rough sketch to be constructed

CONSTRUCTION:

(a) First in constructing the square, the radius of the compasses is set to 10cm to build its sides



Above can be seen the construction Square EFGH.

(b) Draw the diagonals EG and FH .

By measurement:

The length of the diagonal EG=14cm

The length of the diagonal HF=14cm

So EG=HF=14cm

Hence the diagonals are equal in length.

(c) By measurement:

The length of EX=7cm

The length of FX=7cm

The length of GX=7cm

The length of HX=7cm

So EX=FX=GX=HX=7cm

Hence the diagonals bisect each other

The size of angle XEF=90°

Now ΔEXF≡ΔGXH ≡ΔEXH≡ΔGXF (S.S.S)

Hence four congruent triangles are formed by the diagonals