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# SIMILAR TRIANGLES

1. Three equal squares are drawn beside each other as shown in figure 1. Show that $\alpha + \beta + \gamma = 90^o$.

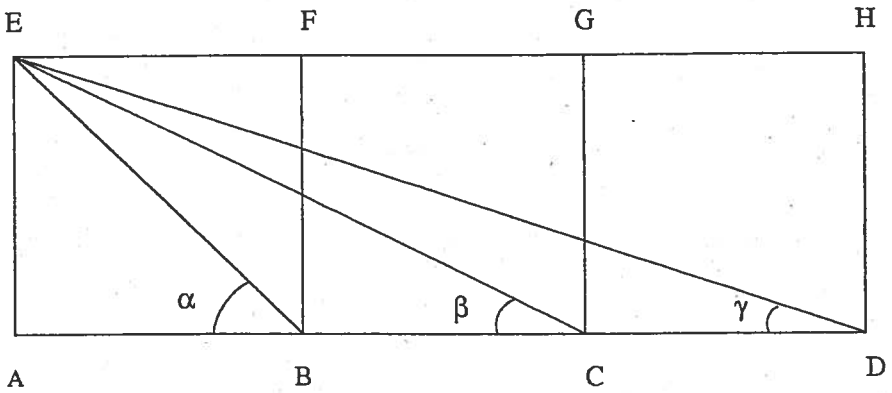


Figure 1:

2. Three equilateral triangles are constructed on the sides of an arbitrary triangle as shown in figure 2. Prove that the centres of those triangles are vertices of an equilateral triangle.

3. Prove that for any triangle $ch_c = 2pr$, where $c$ and $h_c$ are one of the sides and the height towards it, $2p$ is the perimeter and $r$ is the radius of the inscribed ~~triangle~~ circle (see figure 3).

4. Prove that for any triangle $ab = 2Rh_c$.

5. (Ptolomeus' theorem) A quadrilateral ABCD is inscribed in a circle as shown in figure 5. Prove that $ac + bd = ef$.

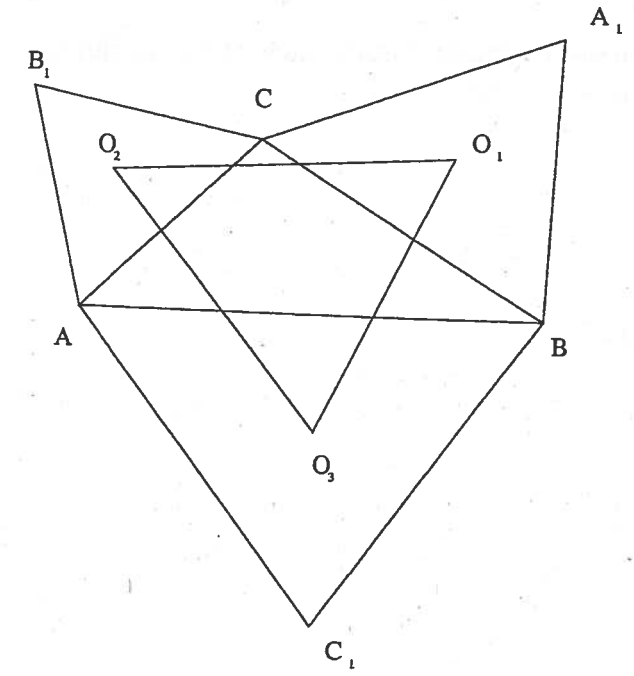


Figure 2:

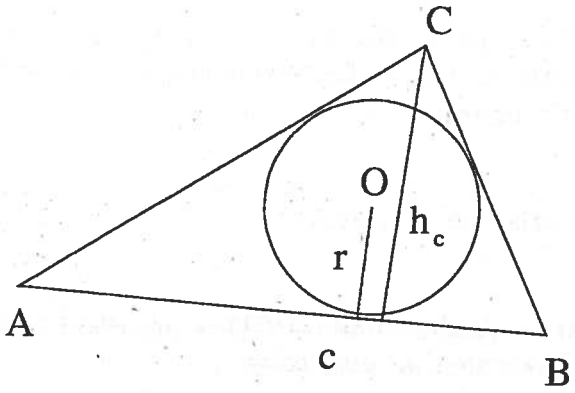


Figure 3:

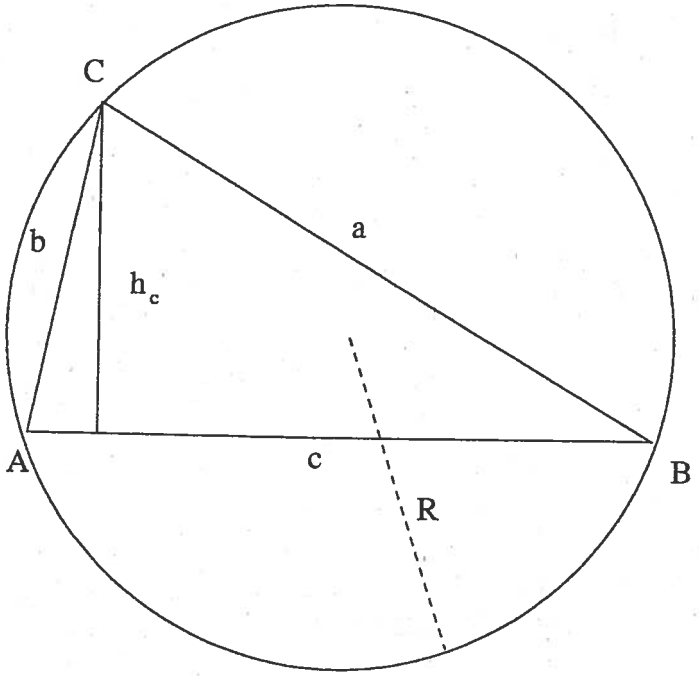


Figure 4:

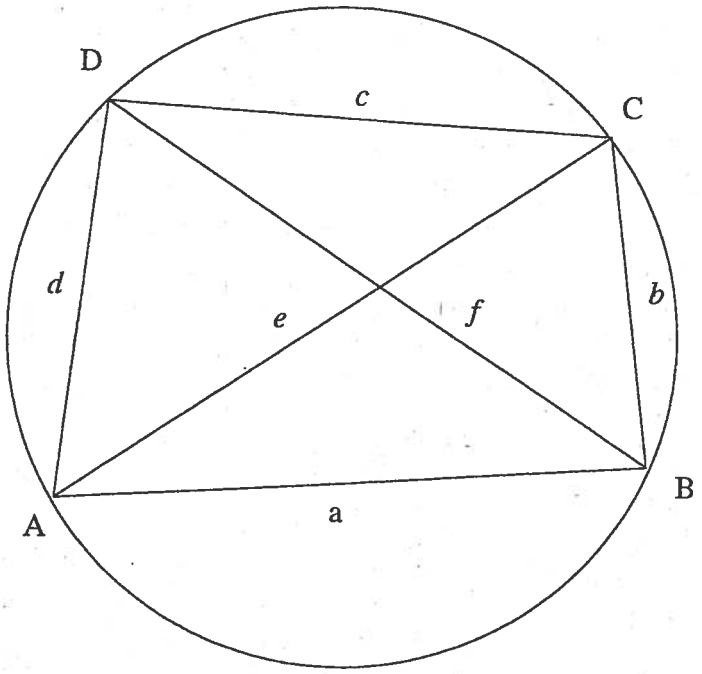


Figure 5: