

Adding auxiliary lines: Student worksheet

http://topdrawer.aamt.edu.au/Geometric-reasoning/Misunderstandings/Revealing-the-invisible/Adding-auxilliary-lines

For each of the problems below it will be necessary to construct auxiliary lines in order to prove the required result.

1. In the diagram below, AB || ED. Prove that b = a + c.



2. Prove that the angle in a semicircle is a right angle. Aim: To prove $\angle ACB = 90^{\circ}$.



3. Prove that the angle at the centre is twice the angle at the circumference standing on the same arc. Aim: To prove $\angle AOB = 2 \times \angle ACB$.



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4. In the quadrilateral *ABCD*, AB = DC and $AB \mid \mid DC$. Prove that *ABCD* is a parallelogram.



5. $\triangle PQR$ is right-angled isosceles triangle. *PX* bisects $\angle RPQ$. Prove that PQ = PR + RX.



Challenges

1. The line *AB* intersects three parallel lines, *PQ*, *UV* and *XY* at *R*, *W* and *Z* respectively. Also, line *DE* intersects *PQ*, *UV* and *XY* at *F*, *G* and *H* respectively. Prove that FG : GH = RW : WZ.



2. In $\triangle PQR$, the bisector of $\angle PQR$ meets *PR* at *X*. Prove that $\frac{PQ}{QR} = \frac{PX}{XR}$.

