# Testing and justifying solutions

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

**1.** Disprove: all quadrilaterals with four equal sides have four right angles. [3 marks]

Its sides are equal but its angles need not be $90^\circ$.

**Answer:** A non-square rhombus.

**2.** A claimed triangle has sides 3, 4, 8. Explain why it cannot serve as a triangle example. [2 marks]

$3+4=7<8$.

**Answer:** It violates the triangle inequality.

**3.** A cyclic quadrilateral has opposite angles $85^\circ$ and $95^\circ$. Is this information consistent? [2 marks]

$85+95=180^\circ$.

**Answer:** Yes.

**4.** A radius 10 circle has a chord 12 long. A student finds its centre distance 8. Check it. [2 marks]

Half-chord 6.

$6^2 + 8^2 = 100 = 10^2$.

**Answer:** Correct.

**5.** A square-construction algorithm is tested only on horizontal sides. Give another important test and explain. [3 marks]

A correct geometric construction should not depend on page orientation.

This can reveal hidden horizontal/vertical assumptions.

**Answer:** Use a sloping side.

**6.** Why must corresponding vertices be named consistently when using triangle similarity? [3 marks]

A wrong ordering can produce ratios between non-corresponding sides and an invalid answer.

**Answer:** They determine which angles and sides match.