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°.

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° and 95°. Is this information consistent? [2 marks]

$85+95=180°$.

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.