Worked answers | Geometry and proof

Angle and similarity reasoning

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Two parallel lines are cut by a transversal. An alternate angle is 72°. Find its matching alternate angle and state the reason. [2 marks]

Alternate angles between parallel lines are equal.

Answer: 72°

2. A triangle has angles 36° and 91°. Find the third. [2 marks]

$180-36-91=53$.

Answer: 53°

3. Triangles have angle sets 50°, 60°, 70° and 70°, 50°, 60°. Are they similar? Explain. [2 marks]

Match equal angles; AA similarity applies.

Answer: Yes.

4. Similar triangles ABC and DEF have A↔D, B↔E, C↔F. AB=8, DE=12, BC=10. Find EF. [2 marks]

Scale factor 12/8=1.5.

EF=10×1.5=15.

Answer: 15

5. A transversal makes equal corresponding angles with two lines. What can be concluded about the lines? [2 marks]

Use the converse of the corresponding-angle theorem.

Answer: They are parallel.

6. A student says two triangles are similar because both contain a 40° angle. Give a counterexample using angle sets. [3 marks]

Both contain 40° but the other angles differ.

One equal angle is insufficient.

Answer: For example 40°, 60°, 80° and 40°, 70°, 70°.