Geometry and proof - Practice test 1

16 questions | 33 marks | 55 minutes

Build angle, triangle and circle reasoning with justified steps.

Equivalent correct methods earn the corresponding marks.

1. Two angles on a straight line are 68° and x°. Find x. [1 mark]

$180 - 68 = 112$.

Answer: 112°

2. Triangle angles are $48^\circ, 73^\circ$ and x°. Find x. [1 mark]

$180 - 48 - 73 = 59$.

Answer: 59°

3. Two parallel lines give a corresponding angle of 61°. Find its partner. [1 mark]

Corresponding angles are equal.

Answer: 61°

4. Congruent triangles have corresponding sides 7 cm and x cm. Find x. [1 mark]

Congruent corresponding sides are equal.

Answer: 7 cm

5. Similar triangles have length factor 1.5. A smaller side is 8 cm. Find its match. [2 marks]

$8 \times 1.5 = 12$.

Answer: 12 cm

6. Two right triangles have equal hypotenuses and one equal corresponding leg. Name a valid congruence test. [2 marks]

Right angle, hypotenuse and side match.

Answer: RHS

7. A circle radius 5 cm has chord 8 cm. Find perpendicular centre distance. [2 marks]

Half-chord 4.

$\sqrt{25-16}=3.$

Answer: 3 cm

8. A circle has centre O. From an exterior point P, PA is tangent at A. $PA=12$ cm and $OA=5$ cm. Find OP. [2 marks]

$\text{Radius} \perp \text{tangent}.$

$\sqrt{144+25}=13.$

Answer: 13 cm

9. A minor central angle is 110°. C lies on its major arc. Find the corresponding circumference angle. [2 marks]

$\frac{110}{2}=55.$

Answer: 55°

10. AB is a diameter of a circle and C is another point on the circle. $\angle CAB=27^\circ$. Find $\angle ABC$. [2 marks]

Angle at $C=90^\circ$.

$180-90-27=63.$

Answer: 63°

11. A cyclic quadrilateral has an angle 104°. Find its opposite angle. [2 marks]

$180 - 104 = 76$.

Answer: 76°

12. A tangent-chord angle is 39°. Find the circumference angle in the alternate segment. [2 marks]

Alternate-segment theorem.

Answer: 39°

13. $AB = AD, BC = CD$ and AC is shared. Prove triangles ABC and ADC congruent. [3 marks]

The three corresponding side pairs are equal.

Answer: SSS.

14. AB is 10 cm. Explain why compass radius 6 cm works for its perpendicular-bisector construction but 4 cm does not. [3 marks]

Equal-radius circles meet twice only when $\text{radius} > 5$ cm.

Answer: 6 exceeds half AB; 4 does not.

15. Disprove: one equal angle makes two triangles similar. [3 marks]

Only one angle matches; the remaining angles differ.

Answer: For example $40^\circ, 60^\circ, 80^\circ$ and $40^\circ, 70^\circ, 70^\circ$.

16. In triangle $ABC, AB = AC$ and D is midpoint BC. Prove $AD \perp BC$. [4 marks]

$AB = AC, BD = DC$, and AD is shared.

SSS gives equal adjacent angles at D.

Their sum 180° makes each 90°.

Answer: AD is perpendicular to BC.