Triangle area

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. A triangle has base 12 cm and perpendicular height 7 cm. Find its area. [2 marks]

$K=\frac{1}{2}\times 12\times 7=42$ cm².

Answer: 42 cm²

2. Find the area using sides 10 m and 13 m enclosing 40°. Round to one decimal place. [2 marks]

$K=\frac{1}{2}\times 10\times 13\times \sin 40°$.

$K\approx 41.8$ m².

Answer: 41.8 m²

3. Sides 6 cm and 8 cm enclose an acute angle. Their triangle has area 12 cm². Find the angle. [2 marks]

$\sin C=2\times 12/(6\times 8)=0.5$.

$C=30°$ because it is acute.

Answer: 30°

4. A 10 m diagonal splits a quadrilateral into triangles. Their perpendicular heights to that diagonal, on opposite sides, are 4 m and 7 m. Find the total area. [3 marks]

$K=\frac{1}{2}\times10\times4+\frac{1}{2}\times10\times7$.

$K=20+35=55$ m².

Answer: 55 m²

5. Two sides are fixed at 8 cm and 11 cm. Find the greatest possible triangle area and state when it occurs. [3 marks]

$K=44\sin C\leq44$.

The maximum sine value 1 occurs at 90°.

Answer: 44 cm², at included angle 90°.

6. Triangle ABC has $a=6$, $b=9$ and $A=35°$. Explain why $\frac{1}{2}\times6\times9\times\sin35°$ is not justified. [3 marks]

Sides a and b meet at C, whereas A is opposite a.

Find a matching included angle before using the formula.

Answer: A is not the included angle between sides a and b.