Cosine rule

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. Two sides 8 cm and 8 cm enclose 60°. Find the third side. [3 marks]

$c^2 = 64 + 64 - 128(\frac{1}{2}) = 64.$

Answer: 8 cm

2. Two sides 6 cm and 10 cm enclose 120°. Find the third side. [3 marks]

$c^2 = 36 + 100 - 120(-\frac{1}{2}) = 196.$

Answer: 14 cm

3. Find the angle opposite 7 cm in a 5-6-7 cm triangle to one decimal place. [3 marks]

$\cos C = \frac{25 + 36 - 49}{60} = 0.2.$

$C \approx 78.4630^\circ.$

Answer: 78.5°

4. Find the largest angle in a 13-14-15 cm triangle to one decimal place. [3 marks]

$\cos C = \frac{169 + 196 - 225}{2 \cdot 13 \cdot 14} = \frac{5}{13}.$

$C \approx 67.3801^\circ.$

Answer: 67.4°

5. Two tracks leave a station 45° apart. Trains are 4 km and 7 km from it. Find their separation to two decimal places. [3 marks]

$d = \sqrt{65 - 28\sqrt{2}} \approx 5.04004.$

Answer: 5.04 km

6. Can sides 2,3,6 cm form a triangle? Justify. [3 marks]

$2 + 3 < 6$, violating the triangle inequality.

Answer: No.