

Precalculus - Law of Sines and Law of Cosines - Test Answer Key

Common Core G-SRT.D.10, G-SRT.D.11, G-SRT.C.8 · maths-pdf.fr/en/

Worked solutions and scoring notes for the 9-question laws of sines and cosines test. Use the scoring line under each solution to award partial credit.

Precalculus · Common Core State Standards: **G-SRT.D.10, G-SRT.D.11, G-SRT.C.8**

Question 1 - Right triangle [2 pts]

$$\text{hyp} = \frac{15}{\cos 28^\circ} \approx 16.99. \quad \text{opp} = 15 \tan 28^\circ \approx 7.98.$$

16.99 and 7.98

Scoring: 1 point each.

Question 2 - Law of Sines [2 pts]

$$b = \frac{12 \sin 75^\circ}{\sin 45^\circ} \approx 16.39.$$

$b \approx 16.39$

Scoring: 1 point for the setup, 1 point for the value.

Question 3 - Ambiguous case [2 pts]

$$(a) \sin B = \frac{10 \sin 30^\circ}{4} = 1.25 > 1: \text{none.} \quad (b) \sin B = \frac{10 \sin 40^\circ}{8} \approx 0.8035: B \approx 53.5^\circ \text{ or } 126.5^\circ.$$

(a) none; (b) 53.5° or 126.5°

Scoring: 1 point for (a), 1 point for (b).

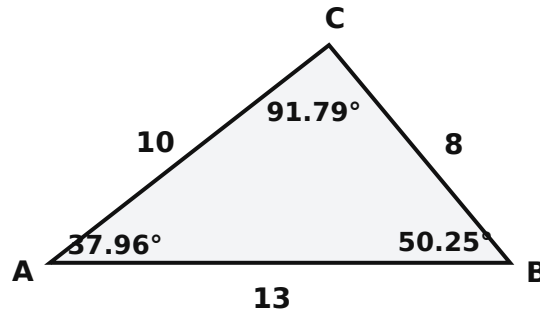
Question 4 - Law of Cosines [2 pts]

$$c^2 = 36 + 81 - 2(6)(9)\cos 60^\circ = 117 - 54 = 63, \text{ so } c = \sqrt{63} \approx 7.94.$$

$c \approx 7.94$

Scoring: 1 point for c squared, 1 point for c .

Question 5 - Find three angles [3 pts]



Solved triangle.

$$\cos A = \frac{100 + 169 - 64}{260}, A \approx 37.96^\circ. \cos B = \frac{64 + 169 - 100}{208}, B \approx 50.25^\circ. C = 180^\circ - A - B \approx 91.79^\circ.$$

$37.96^\circ, 50.25^\circ, 91.79^\circ$

Scoring: 1 point for each angle.

Question 6 - Area [2 pts]

$$\frac{1}{2}(7)(10)\sin 50^\circ \approx 26.81.$$

26.81 **square units**

Scoring: 1 point for the formula, 1 point for the value.

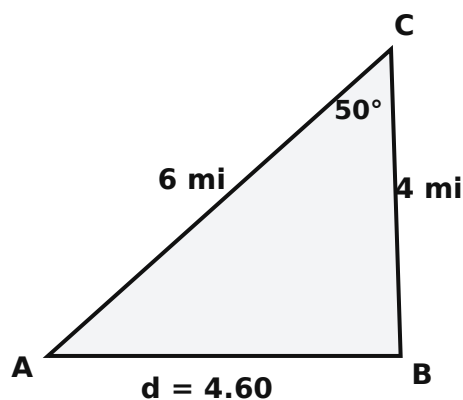
Question 7 - Heron's formula [2 pts]

$$s = 18. \text{ Area} = \sqrt{18 \cdot 9 \cdot 8 \cdot 1} = \sqrt{1296} = 36.$$

36 square units

Scoring: 1 point for s , 1 point for the area.

Question 8 - Hikers [3 pts]



Using the Law of Cosines.

(a) $d^2 = 16 + 36 - 48\cos 50^\circ \approx 21.15$, $d \approx 4.60$. (b) $\frac{1}{2}(4)(6)\sin 50^\circ \approx 9.19$. (c) $\cos M = \frac{16 + d^2 - 36}{2 \cdot 4 \cdot d}$, so $M \approx 88.2^\circ$.

4.60 mi; 9.19 mi²; 88.2°

Scoring: 1 point for each part.

Question 9 - Largest angle [2 pts]

$\cos C = \frac{49 + 81 - 144}{126} = -\frac{1}{9}$, so $C \approx 96.38^\circ$.

96.38°

Scoring: 1 point for the cosine, 1 point for the angle.

Total
20 points