

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

Common Core G-SRT.D.9, G-SRT.D.10, G-SRT.D.11 · maths-pdf.fr/en/

Use this answer key and scoring guide for the law of sines and cosines test. Each solution shows the full work, and the scoring note tells how the points are split between method and final answer. Partial credit is listed so that grading stays consistent from one paper to the next.

Geometry · Common Core State Standards: **G-SRT.D.9, G-SRT.D.10, G-SRT.D.11**

Question 1 - Angle from the area [2 pts]

$$48 = \frac{1}{2} \cdot 12 \cdot 10 \cdot \sin C$$

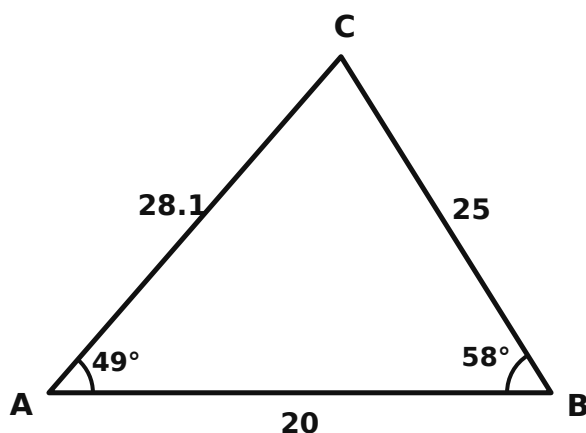
$$\sin C = \frac{48}{60} = 0.8$$

$$C = \sin^{-1}(0.8) = 53.1^\circ$$

$$\mathbf{C = 53.1^\circ}$$

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

Question 2 - Law of Sines [2 pts]



b is about 28.1.

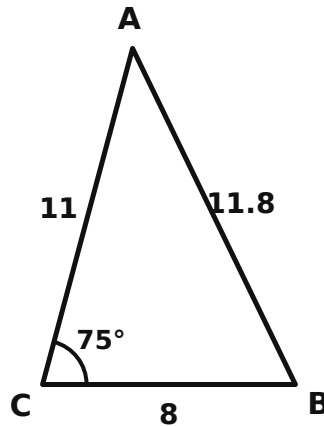
$$\frac{b}{\sin 58^\circ} = \frac{25}{\sin 49^\circ}$$

$$b = 28.1$$

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

Question 3 - Law of Cosines [3 pts]



c is about 11.8.

a. $c^2 = 8^2 + 11^2 - 2 \cdot 8 \cdot 11 \cdot \cos 75^\circ$

b. $c^2 = 185 - 176 \cdot 0.2588 = 139.4$, so $c = 11.8$

Scoring: (a) 1 point. (b) 1 point for the substitution, 1 point for c .

Question 4 - Angle from three sides [2 pts]

$$7^2 = 6^2 + 10^2 - 2 \cdot 6 \cdot 10 \cdot \cos B$$

$$\cos B = \frac{36 + 100 - 49}{120} = 0.725$$

$$B = 43.5^\circ$$

$$43.5^\circ$$

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

Question 5 - Choose the law [2 pts]

- a. The Law of Cosines.
- b. The Law of Sines (after finding the third angle if needed).

Scoring: 1 point per part.

Question 6 - Right triangle? [2 pts]

$$16^2 = 9^2 + 12^2 - 2 \cdot 9 \cdot 12 \cdot \cos C$$

$$\cos C = \frac{81 + 144 - 256}{216} = -0.1435$$

The cosine is negative, so the largest angle is obtuse (about 98.3°).

Obtuse

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

Question 7 - Bridge length [3 pts]

$$d^2 = 15^2 + 22^2 - 2 \cdot 15 \cdot 22 \cdot \cos 36^\circ$$

$$d^2 = 709 - 660 \cdot 0.8090 = 175.0$$

$$d = 13.2$$

13.2 meters

Scoring: 1 point for the setup, 1 point for the substitution, 1 point for d .

Question 8 - Park area [2 pts]

$$\frac{1}{2} \cdot 14 \cdot 20 \cdot \sin 70^\circ = 140 \cdot 0.9397 = 131.6$$

131.6 square blocks

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

Question 9 - Check reasonableness [2 pts]

The 67° angle is largest, and 20 is the longest side, so the pattern holds.

The smallest angle, 52° , faces the shortest side, 17.1.

Scoring: 1 point each.

Total
20 points