

Precalculus · Laws of Sines and Cosines and Triangle Area · Test Answer Key

Common Core G-SRT.D.9, G-SRT.D.10, G-SRT.D.11 · mathovore.fr

This precalculus law sines test answer key gives the full solution and the scoring guide for each of the 8 test questions on laws of sines and cosines and triangle area.

Worked solutions with a scoring guide. Award each point for the step named in the scoring line, allow answers within 0.1 of the key when intermediate rounding differs, and accept any correct method.

Precalculus Common Core: G-SRT.D.9 · G-SRT.D.10 · G-SRT.D.11

Precalculus Law Sines Test Answer Key: questions 1-5

Question 1: Area with sine (2 points)

$$\text{Area} = \frac{1}{2}(14)(9)\sin 52^\circ = 63\sin 52^\circ \approx 49.6 \text{ cm}^2.$$

Scoring: 1 point for the correct formula and substitution, 1 point for the correct value.

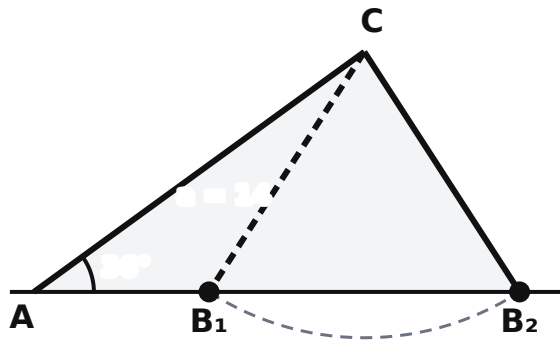
Question 2: Law of Sines (3 points)

- a. $C = 58^\circ$
- b. $b = \frac{15\sin 84^\circ}{\sin 38^\circ} \approx 24.23$
- c. $c = \frac{15\sin 58^\circ}{\sin 38^\circ} \approx 20.66$

Scoring: 1 point for each part.

Question 3: Ambiguous case (3 points)

- a. $h = 20\sin 36^\circ \approx 11.76$ and $11.76 < 14 < 20$, so **two triangles exist**
- b. $B_1 \approx 57.1^\circ$ and $B_2 \approx 122.9^\circ$
- c. $c_1 = \frac{14\sin 86.9^\circ}{\sin 36^\circ} \approx 23.78$ and $c_2 = \frac{14\sin 21.1^\circ}{\sin 36^\circ} \approx 8.58$



Both triangles share A, C and the side $a = 14$.

Scoring: 1 point for each part.

Question 4: Law of Cosines: find a side (2 points)

$$c^2 = 13^2 + 19^2 - 2(13)(19)\cos 47^\circ = 530 - 494\cos 47^\circ \approx 193.09, \text{ so } c \approx 13.90.$$

Scoring: 1 point for the correct substitution, 1 point for the correct value.

Question 5: Law of Cosines: find an angle (2 points)

$$\text{The largest angle is opposite 15: } \cos \theta = \frac{10^2 + 13^2 - 15^2}{2(10)(13)} = \frac{44}{260} \approx 0.1692, \text{ so } \theta \approx 80.3^\circ.$$

Scoring: 1 point for choosing the angle opposite 15 and substituting correctly, 1 point for the correct angle.

Precalculus Law Sines Test Answer Key: questions 6-8

Question 6: Heron's formula (2 points)

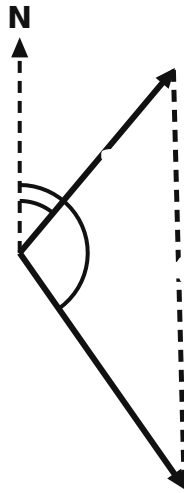
$$s = \frac{17+25+28}{2} = 35. \text{ Area} = \sqrt{35(18)(10)(7)} = \sqrt{44,100} = \mathbf{210} \text{ square units.}$$

Scoring: 1 point for $s = 35$ and the substitution, 1 point for the area.

Question 7: Ships and bearings (3 points)

$$\text{a. } 145^\circ - 40^\circ = 105^\circ$$

$$\text{b. } d^2 = 25^2 + 30^2 - 2(25)(30)\cos 105^\circ \approx 1913.23, \text{ so } d \approx 43.74 \text{ mi}$$



The ships are about 43.74 miles apart.

Scoring: 1 point for the angle; 1 point for the correct Law of Cosines setup and 1 point for the correct distance.

Question 8: Lot area and height (3 points)

- a. $s = \frac{80+110+125}{2} = 157.5$. $\text{Area} = \sqrt{157.5(77.5)(47.5)(32.5)} \approx 4,341 \text{ ft}^2$
 b. $\frac{1}{2}(125)h = 4,341$, so $h = \frac{2(4,341)}{125} \approx 69.5 \text{ ft}$

Scoring: part (a) 1 point for s and the setup, 1 point for the area; part (b) 1 point.

Scoring summary

Total
20 points: add the points of every question of this precalculus law sines test answer key.

How to use this precalculus law sines test answer key

Use this precalculus law sines test answer key to score the test fairly and to see which skills need more practice.

