

Name _____

Precalculus
Test Review – Law of Sines & Cosines

SOLVE FOR THE MISSING PARTS OF $\triangle ABC$. IF 2 TRIANGLES EXIST,
SOLVE FOR EACH AND FIND THE AREA OF EACH TRIANGLE.

1) Given: $A = 32^\circ$, $B = 48^\circ$, $a = 8$

Solve the triangle

Determine the Area of the Triangle

$$\angle A = 32^\circ$$

$$\angle B = 48^\circ$$

$$\angle C = 100^\circ$$

$$a = 8$$

$$b = 11.2$$

$$c = 14.9$$

$$A = 44.1$$

2) Given: $a = 10$, $b = 7$, $c = 5$

Solve the triangle

Determine the Area of the Triangle

$$\angle A = ~~111.8^\circ~~ 111.8^\circ$$

$$\angle B = 40.5^\circ$$

$$\angle C = 27.7^\circ$$

$$a = 10$$

$$b = 7$$

$$c = 5$$

$$A = 16.3$$

3) Given: $a = 12$, $b = 5$, $C = 20^\circ$

Solve the triangle

Determine the Area of the Triangle

$$\angle A = 146.8^\circ$$

$$\angle B = 13.2^\circ$$

$$\angle C = 20^\circ$$

$$a = 12$$

$$b = 5$$

$$c = 7.5$$

$$A = 10.3$$

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4) Given: $B = 50^\circ$, $c = 28$, $b = 32$

Solve the triangle

Determine the Area of the Triangle

$$\angle A = 87.9^\circ$$

$$\angle B = 50^\circ$$

$$\angle C = 42.1^\circ$$

$$a = 41.7$$

$$b = 32$$

$$c = 28$$

$$A = 447.3$$

5) $a = 6$, $b = 7$, $A = 30^\circ$

Solve the triangle

Determine the Area of the Triangle

$$\angle A = 30^\circ$$

$$\angle B = 35.7^\circ$$

$$\angle C = 114.3^\circ$$

$$a = 6$$

$$b = 7$$

$$c = 10.9$$



$$A = 19.1$$

$$\angle A = 30^\circ$$

$$\angle B = 144.3^\circ$$

$$\angle C = 5.7^\circ$$

$$a = 6$$

$$b = 7$$

$$c = 1.2$$



$$A = 2.1$$

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Solve the following word problems. Draw a triangle for each problem to receive full credit:

- 6) A post is supported by two wires (one on each side going in opposite directions) creating an angle of 82° between the wires. The ends of the wires are 12m apart on the ground with one wire forming an angle of 40° with the ground. Find the lengths of the wires.

Wires are 7.8m and 10.4m

- 7) How tall is the post in between the two wires in question 6?

6.6m

- 8) A satellite is orbiting earth and can be seen from the ground in both Phoenix, Arizona and Los Angeles, California. If the angle of elevation in Phoenix to the satellite is 60 degrees, the angle of elevation in Los Angeles to the satellite is 75 degrees, and the distance from Phoenix to LA is 372 miles, determine the following.

- a) What is the distance from the satellite to Los Angeles?

455.6 mi

- b) What is the current altitude (height) of the satellite?

440.1 mi

- 9) A pilot flying a fighter jet has two different targets he must fire upon. The targets are 2.4 miles apart. If the angle of depression from the jet to target A is 45 degrees, and the angle of depression from the jet to target B is 38 degrees, determine the distance the fighter jet must fire to hit target A AND target B.

distance to A : 1.5mi

distance to B : 1.7mi

Test Review - Law of Sines &

Solve each equation for $0 \leq \theta < 2\pi$.

11) $3 + \cot^2 \theta + 3\csc \theta = 0$

$$\frac{3\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

12) $-\sin \theta = -2\sin \theta + \sqrt{3}\sin \theta \cot \theta$

$$\frac{\pi}{3}, \frac{4\pi}{3}$$

13) $-1 + \cos^2 \theta = 5\cos^2 \theta + 4\cos \theta$

$$\frac{2\pi}{3}, \frac{4\pi}{3}$$

14) $\sqrt{3}\cot \theta + \cot \theta \tan \theta - 2\tan \theta = -2\tan \theta$

$$\frac{2\pi}{3}, \frac{5\pi}{3}$$

15) $0 = \sec^2 \theta + 2\tan \theta$

$$\frac{3\pi}{4}, \frac{7\pi}{4}$$

16) $3\sec^2 \theta = 2\sqrt{3}\sec \theta$

$$\frac{\pi}{6}, \frac{11\pi}{6}$$