

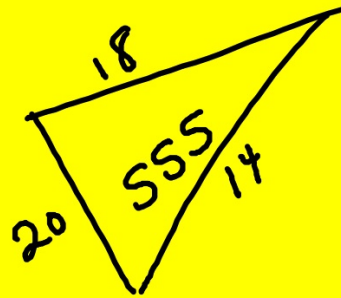
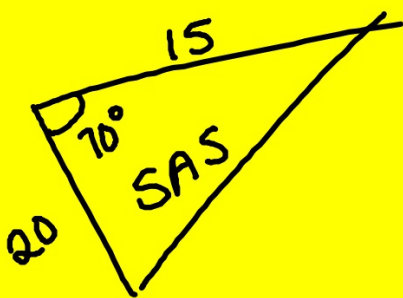
WARM UP

Niya stands on one side of a river and looks across at point A. She estimates that it is 100 yards away. Point B is also across the river 80 yards from point A. Angle A is 80 degrees, the angle Niya stands at is 30 degrees.

How far is Niya from Point B?

4.3 Using the Law of Cosines

2 specific cases: SAS, SSS



Law of Cosines

If A , B , and C are the measures of the angles of a triangle, and a , b , and c are the lengths of the sides opposite these angles, then:

$$\underline{a}^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

When do you use Law of Cosines?

SSS

and

SAS

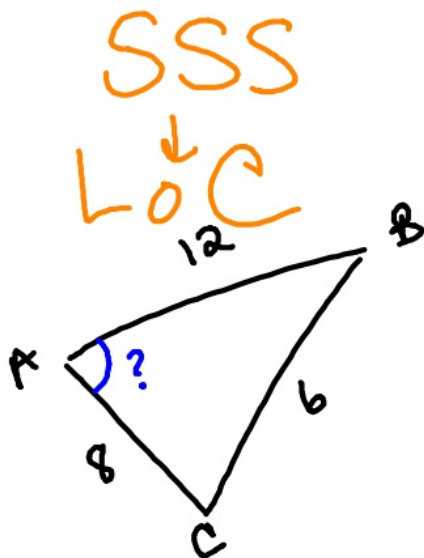
NON

RIGHT

TRIANGLES

1: Solving for an angle. Solve for angle A . Round to a whole degree.

$$a=6, b=8, c=12$$



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$6^2 = 8^2 + 12^2 - 2(8)(12) \cos A$$

$$36 = 64 + 144 - 192 \cos A$$

$$36 = \cancel{208} - 192 \cos A$$
$$\frac{-208}{-208} \quad \frac{+208}{-208}$$

$$-172 = -192 \cos A$$

$$\frac{-172}{-192} = \cos A$$

$$.895833 = \cos A$$

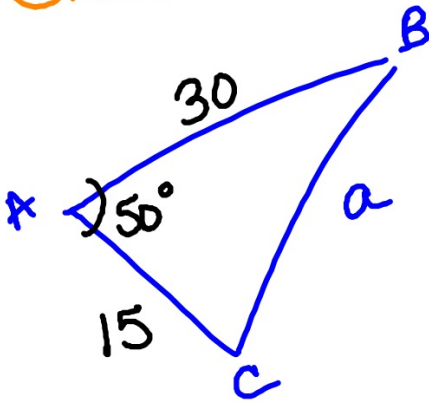
$$\cos^{-1}(.895833) = A$$

$$\boxed{26^\circ = A}$$

Ex 2: Solving for a side. Use the given information to find the third side of the triangle.

$$\angle A = 50^\circ, b = 15, c = 30$$

SAS \rightarrow "included angle" \rightarrow L o C



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 15^2 + 30^2 - 2(15)(30) \cos(50)$$

$$a^2 = 546.49$$

$$a = \sqrt{546.49}$$

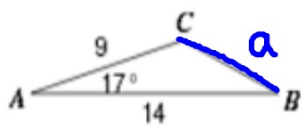
$$a = 23.38$$

CHECKPOINT:

Score: /2

Use the Law of Cosines to solve the information below. Round all decimals to the 10th.

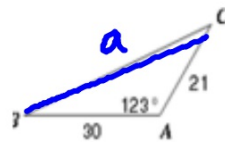
4) Find BC



22.6

5.

Find BC



22.45

Maze

- > Analyze Law of Sines vs. Law of Cosines
- > The goal is to be efficient
- > Complete all problems on the correct path
- > Turn in your work

Law of Cosines Graphic Organizer

- Complete it
- Glue it in your journal

- Maze is DUE on Thursday

Exit Journal

*Graded for complete sentences,
accuracy, and knowledge*

Explain the difference between using SOH-CAH-TOA, Law of Sines, & Law of Cosines. Use examples as needed.