

Starter: Solve each equation for x. Round to the nearest tenth.

Hint: Cross multiply and use a calculator

$$\frac{\sin(48^\circ)}{x} = \frac{\sin(42^\circ)}{12}$$

$$\frac{x \sin 42}{\sin 42} = \frac{12 \sin 48}{\sin 42}$$

$$x = \frac{12 \sin 48}{\sin 42}$$

$$x =$$

$$\frac{\sin(132^\circ)}{x} = \frac{\sin(23^\circ)}{6.7}$$

$$\frac{x \sin 23}{\sin 23} = \frac{6.7 \sin 132}{\sin 23}$$

$$x = \frac{6.7 \sin 132}{\sin 23}$$

$$x =$$

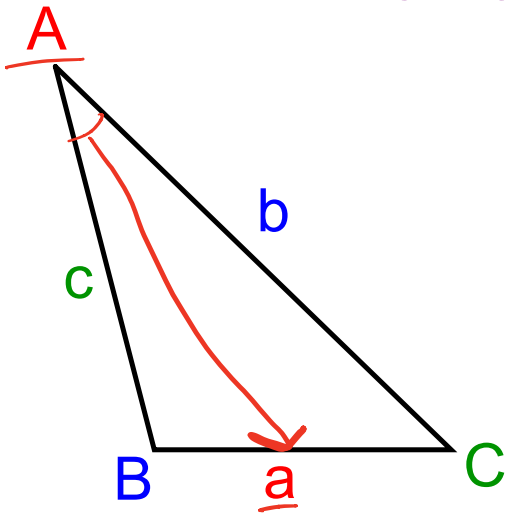
7-2 Law of Sines, Triangle Area

Objectives:

7-2a: I can solve a triangle using the Law of Sines.

7-2b: I can find the area of a triangle using trigonometric formulas.

Law of Sines



$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

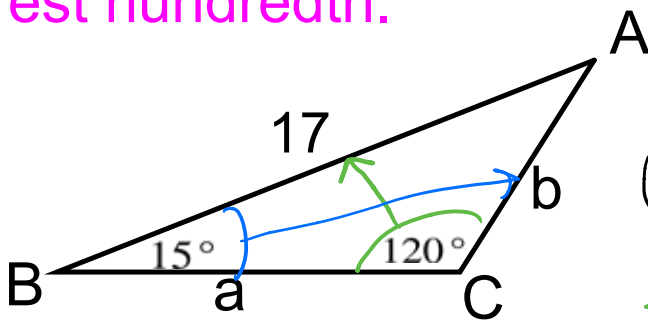
Solve the triangle:
means find all 3 angles
and all 3 sides.

The \sin of angle A over the side a where the side a is always across from angle A.

↑
Same goes for B and C.

↗ means to find all 3 angles and all 3 sides.

Solve the triangle. Round to the nearest hundredth.



using the Law of Sines...

$$\textcircled{1} \frac{\sin(120)}{17} = \frac{\sin(15)}{b}$$

Solve for b, by cross multiplying

$$b \sin(120) = 17 \sin(15)$$

divide both sides by $\sin(120)$

$$\frac{b \sin(120)}{\sin(120)} = \frac{17 \sin(15)}{\sin(120)}$$

$$b = 5.08$$

$\textcircled{2}$ To find angle A we take

$$180^\circ - 120^\circ - 15^\circ = 45^\circ$$

$$\boxed{\angle A = 45^\circ}$$

$\textcircled{3}$ To find Side a we use the law of sines again.

$$\frac{\sin 45}{a} = \frac{\sin 120}{17}$$

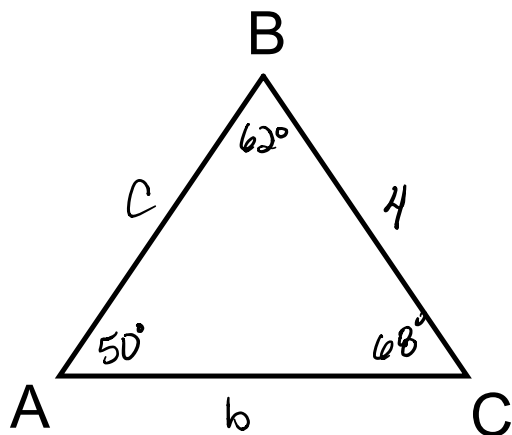
$$\frac{17 \sin 45}{\sin 120} = \frac{a \sin 120}{\sin 120}$$

$$\frac{17 \sin 45}{\sin 120} = a$$

$$\boxed{13.88 = a}$$

Solve the triangle. Round to the nearest tenth.

$$A = 50^\circ, B = 62^\circ, a = 4$$



First label the angles and side we know

To find angle C ...

$$180 - 50 - 62 = \boxed{68^\circ}$$

$$\frac{\sin 50}{4} = \frac{\sin 62}{b}$$

$$\frac{b \sin 50}{\cancel{\sin 50}} = \frac{4 \sin 62}{\sin 50}$$

$$b = \frac{4 \sin 62}{\sin 50}$$

$$\boxed{b = 4.6}$$

$$\frac{\sin 50}{4} = \frac{\sin 68}{c}$$

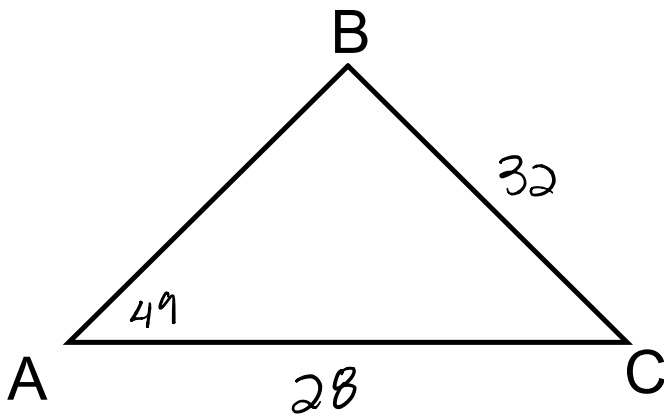
$$\frac{c \sin 50}{\sin 50} = \frac{4 \sin 68}{\sin 50}$$

$$c = \frac{4 \sin 68}{\sin 50}$$

$$\boxed{c = 4.8}$$

Solve the triangle. Round to the nearest tenth.

$$A = 49^\circ, a = 32, b = 28$$



First label, then setup.

$$\frac{\sin 49}{32} = \frac{\sin B}{28}$$

Notice we are looking for an angle this time. But we cross multiply still.

Last find side c...

$$\frac{\sin 49}{32} = \frac{\sin 89.7}{c}$$

$$\frac{c \sin 49}{\sin 49} = \frac{32 \sin 89.7}{\sin 49}$$

$$c = \frac{32 \sin 89.7}{\sin 49}$$

$$c = 42.4$$

$$\frac{28 \sin 49}{32} = \frac{32 \sin B}{32}$$

$$\sin^{-1} \frac{28 \sin 49}{32} = \sin^{-1} \sin B$$

now take \sin^{-1} on both sides

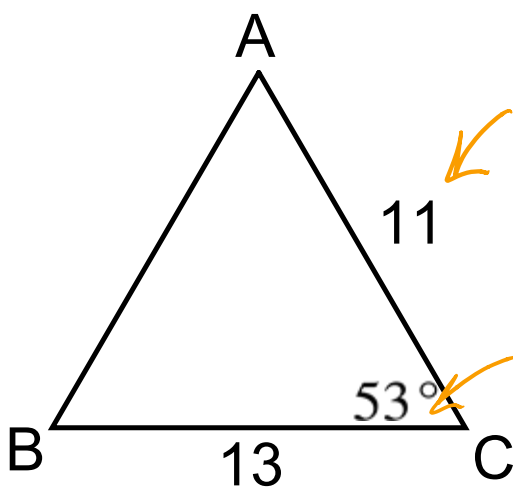
$$\sin^{-1} \frac{28 \sin 49}{32} = B$$

$$B = 41.3^\circ$$

$$\angle C = 180 - 41.3 - 49 = 89.7^\circ$$

To find the area of a triangle we use 2 sides and the angle between them.

Find the area of the given triangle. Round to the nearest tenth.



↑
second
side

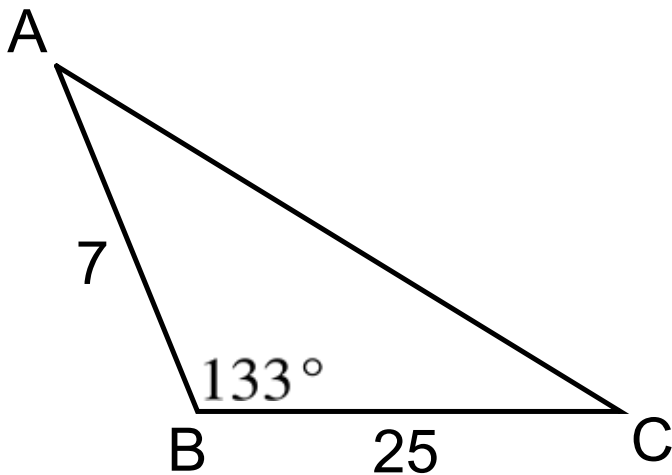
← one side

← angle between 2 sides.

$$\frac{13 \cdot 11 \cdot \sin 53}{2} = \text{Area}$$

$$57.1 = \text{Area}$$

Find the area of the given triangle. Round to the nearest tenth.



$$\frac{7 \cdot 25 \cdot \sin 133}{2} = \text{area}$$

$$\text{Area} = 63.99$$

rounded to the
nearest tenth...

$$\text{area} = 64.0$$

Attachments

HW7-1 AK Graphing Trig.pdf

Quiz7.1 AK.pdf