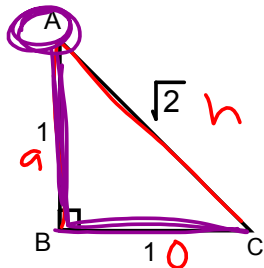


Warm Up:

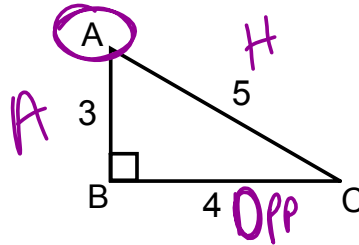
Using SOH CAH TOA, find the sine, cosine, and tangent of angle A in each triangle.

1.



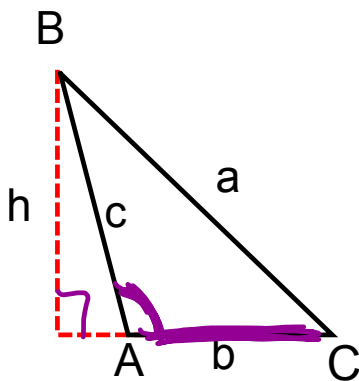
$$\tan A = \frac{1}{1} = 1$$

2.



$$\tan A = \frac{4}{3}$$

LT: Find the area of the triangle or use it to solve for the missing part of the triangle



Area of a Triangle:

$$\frac{1}{2} bh = A$$

But we don't know the value of h....

BUT!... $c \cdot \sin A = \frac{h}{c} \cdot c$ SO... $h = c \sin A$

So, the area of a triangle is...

$$A = \frac{1}{2} bc \sin A$$

Variations of the formula...

$$A = \frac{1}{2} bc \sin A$$

$$A = \frac{1}{2} ab \sin C$$

$$A = \frac{1}{2} ac \sin B$$

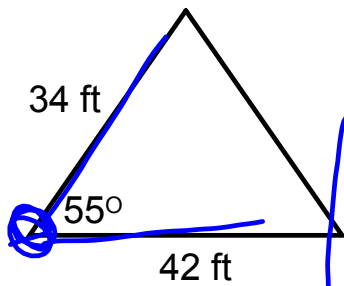
sides

* It's all the same thing... the sine of an angle between 2 sides



Find the area of the following triangle...

Ex. 1)

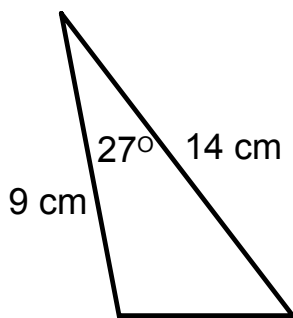


$$A = \frac{1}{2} (34)(42) \sin 55$$

$$A = 584.87 \text{ ft}^2$$

Find the area of the following triangle...

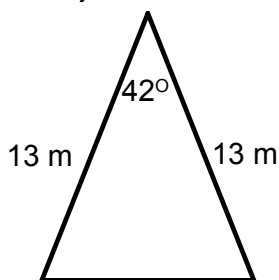
Ex. 2)



$$A = \frac{1}{2}(14)(9)\sin(27)$$
$$A = 28.6 \text{ cm}^2$$

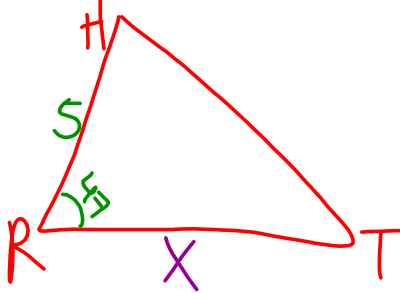
Find the area of the following triangle...

Ex. 3)



$$A = \frac{1}{2}(13)(13)\sin(42)$$
$$A = 56.54 \text{ m}^2$$

Ex. 4) If the area of $\triangle HRT$ is 15 ft^2 , where $HR = 5 \text{ ft}$ and $m\angle TRH = 47^\circ$. Find the length of side RT . Round to the nearest hundredth.



$$\text{Area} = 15$$

$$15 = \frac{1}{2}(5)(x)\sin 47$$

$$(.5 \cdot 5 \sin 47)$$

$$x = 8.20 \text{ ft}$$

Ex. 5) If the area of $\triangle JKR$ is 24 in^2 , where $JR = 8 \text{ in}$ and $m\angle KJR = 85^\circ$. Find the length of side JK . Round to the nearest thousandth.

$$24 = \frac{1}{2}(8)(x)(\sin 85^\circ)$$

$$(.5)(8)(\sin 85^\circ)$$

$$x = 6.023 \text{ in}$$

Ex. 6) If the area of $\triangle JKR$ is 24 in^2 , where $JR = 8 \text{ in}$ and $m\angle KJR = 85^\circ$. Find the length of side JK . Round to the nearest tenth.

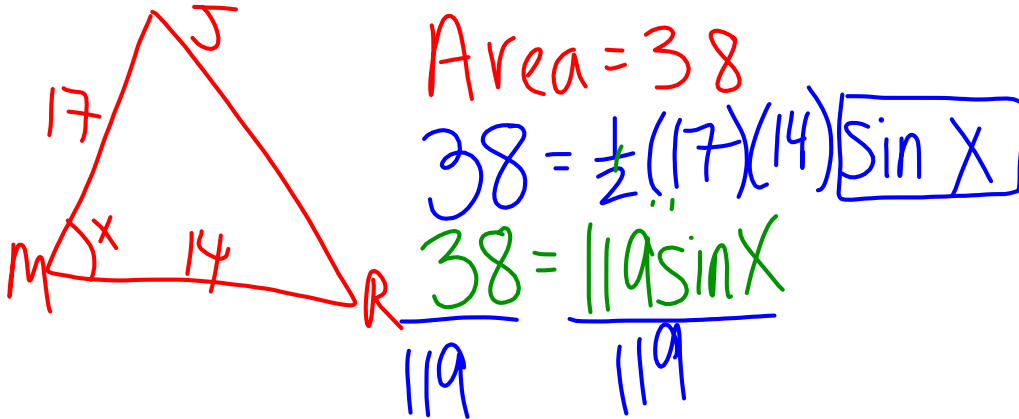
Ex. 7) If the area of $\triangle MCK$ is 90 km^2 , where $MK = 42 \text{ km}$ and $m\angle KMC = 37^\circ$. Find the length of side MC . Round to the nearest tenth.

$$90 = \frac{1}{2} (42)(x) \sin(37)$$

$$x = \frac{90}{(.5 \cdot 42 \sin(37))}$$

$$x = 7.1 \text{ km}$$

Ex. 8) If the area of $\triangle JMR$ is 38 cm^2 , where $JM = 17 \text{ cm}$ and $MR = 14 \text{ cm}$. Find $m\angle JMR$.
Round to the nearest tenth.



decimal = $\sin x$

$$\sin^{-1}(\text{Ans}) = x = 18.6^\circ$$

Ex. 9) If the area of $\triangle AGR$ is 107 in^2 , where $RG = 57 \text{ in}$ and $AR = 32 \text{ in}$. Find $m\angle ARG$.
Round to the nearest tenth.

$$6.7^\circ$$

Ex. 10) If the area of $\triangle SRA$ is ~~20~~²³ yd^2 , where $RA = 10$ yd and $SA = 5$ yd. Find $m\angle SAR$.
Round to the nearest thousandth.

$$23 = \frac{1}{2}(10)(5)\sin X$$

$$\frac{23}{25} =$$

$$66.926^\circ$$