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The Trigonometric Functions

SINE

COSINE

TANGENT

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SINE

COSINE

TANGENT

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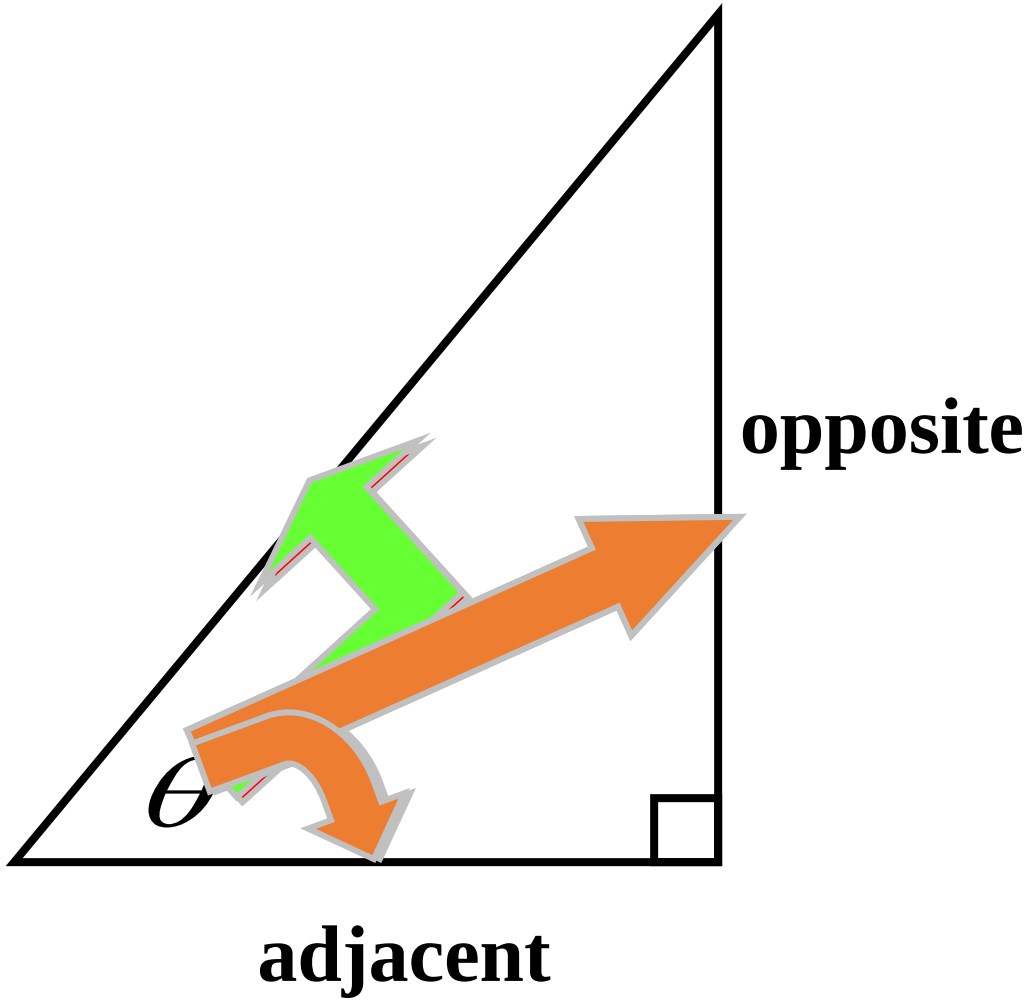
$$Sin = \frac{Opp\ \text{Leg}}{Hyp}$$

$$Cos = \frac{Adj\ \text{Leg}}{Hyp}$$

$$Tan = \frac{Opp\ \text{Leg}}{Adj\ \text{Leg}}$$



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Use the following Indian term to remember the trigonometric functions.

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Indian

SOHCAHTOA

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SOHCAHTOA

Indian

Sin
Opp
Hyp

Cos
Adj
Hyp

Tan
Opp
Adj

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Several examples of finding sin, cos, and tan will be demonstrated in the examples to follow.

The answers can be expressed *as a decimal or ratio.)*

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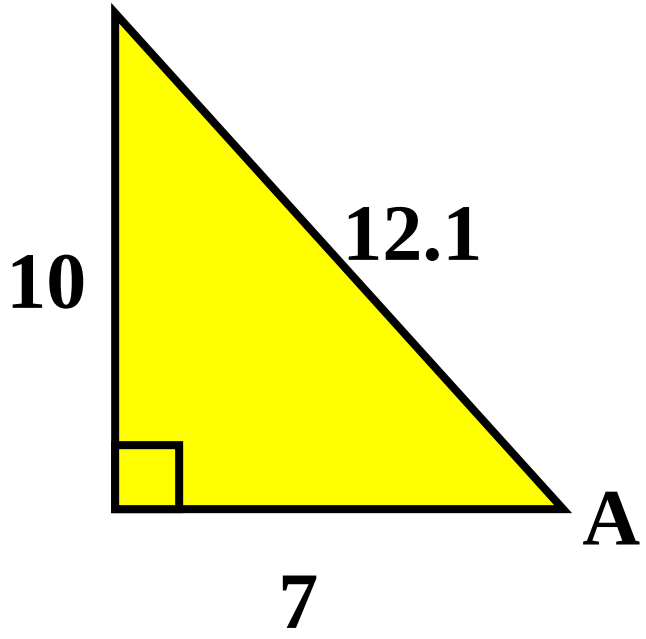
Find the sine, the cosine, and the tangent of angle A.

Give a fraction and decimal answer (round to 4 places).



$$\sin A = \frac{opp}{hyp} = \frac{10}{12.1} \approx .8264$$

$$\cos A = \frac{adj}{hyp} = \frac{7}{12.1} \approx .5785$$

$$\tan A = \frac{opp}{adj} = \frac{10}{7} \approx 1.4286$$

Now, figure out your ratios.

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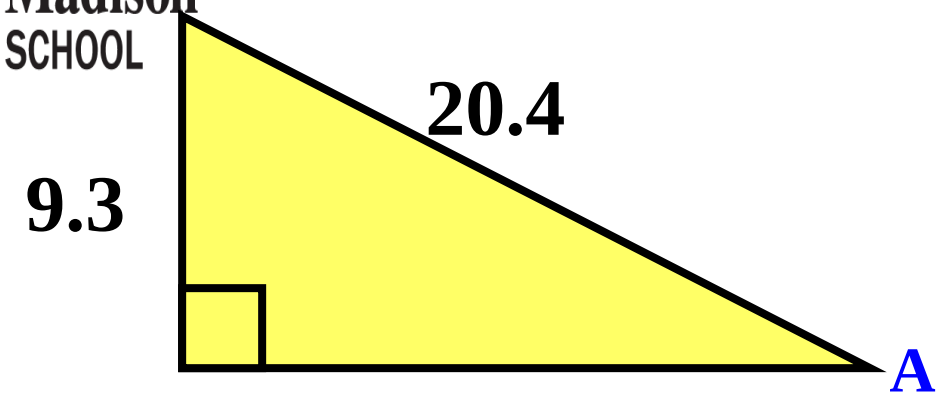
Find the sine, the cosine, and the tangent of angle A



Give a fraction and decimal answer (round to 4 decimal places).

$$\sin A = \frac{opp}{hyp} = \frac{9.3}{20.4} \approx .4559$$

$$\cos A = \frac{adj}{hyp} = \frac{22.5}{20.4} \approx 1.1029$$

$$\tan A = \frac{opp}{adj} = \frac{9.3}{22.5} \approx .4133$$

Now, figure out your ratios.

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When we are trying to find a **side**
we use sin, cos, or tan.

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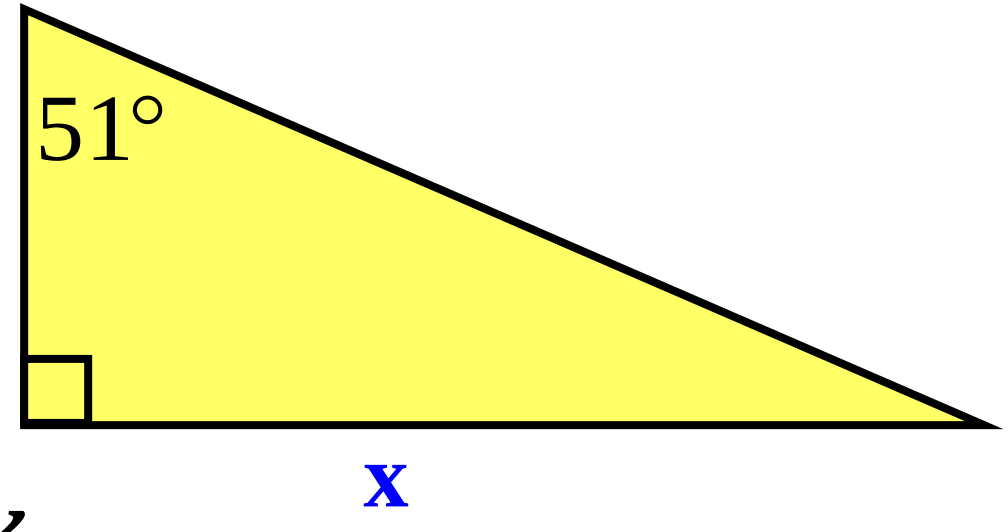
Ex: 1 Figure out which ratio to use. Find x. Round to the nearest tenth.



$$\tan(51) = \frac{x}{24}$$

$$24\tan(51) = x$$

24	tan	51	)

$$x \approx 29.6\,\text{m}$$

Now, figure out which trig ratio you have and set up the problem.

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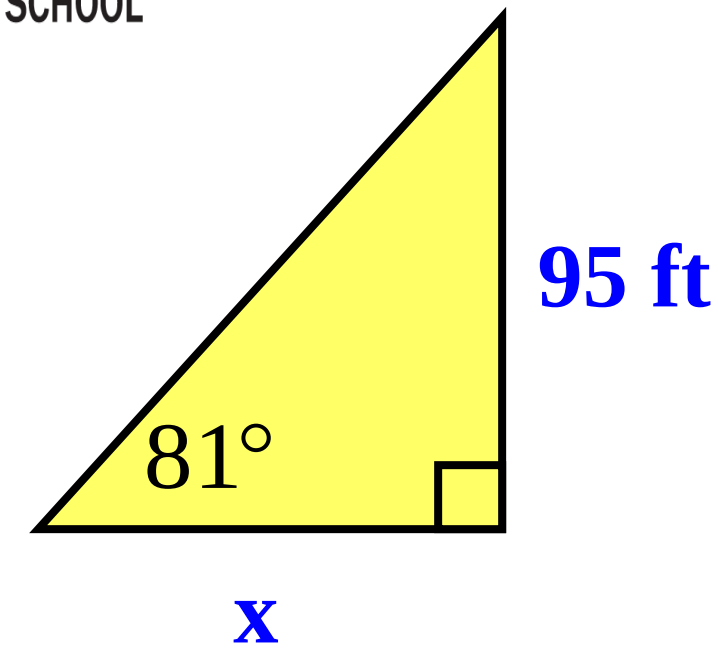
Ex: 2 Find the missing side. Round to the nearest tenth.



$$\tan(81) = \frac{95}{x}$$

$$x\tan(81) = 95$$

$$x = \frac{95}{(\tan(81))}$$

95	÷	(	tan	81	)	)	=

$$x \approx 15.0 \text{ ft}$$

Now, figure out which trig ratio you have and set up the problem.

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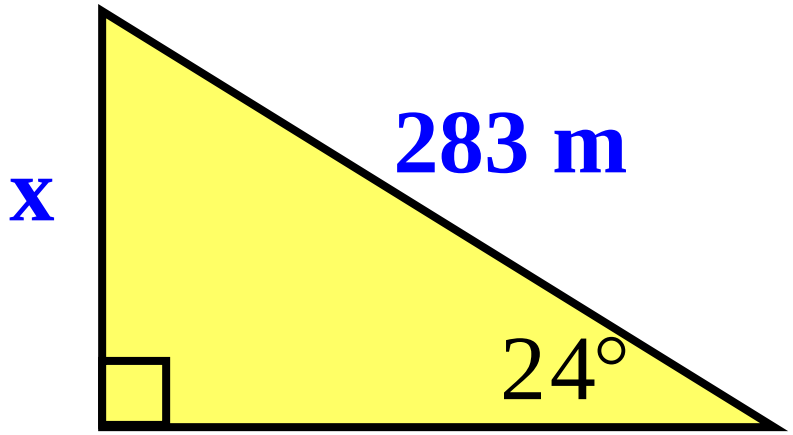
Ex: 3 Find the missing side. Round to the nearest tenth.



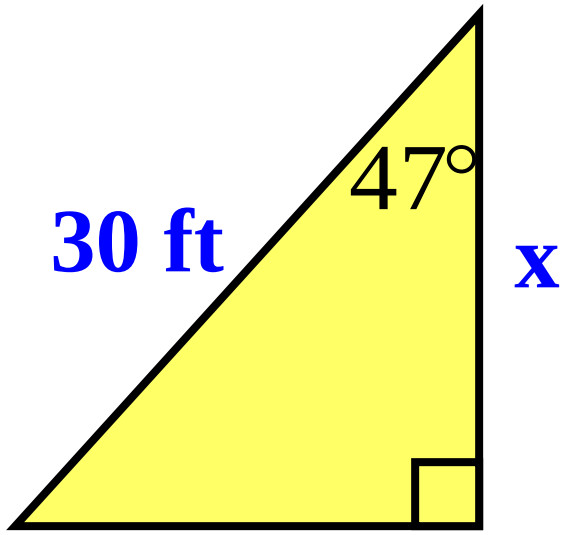
$$\sin(24) = \frac{x}{283}$$

$$283\sin(24) = x$$

Now, figure out which trig ratio you have and set up the problem.

$$x \approx 115.1\,\text{m}$$

Ex. 4 **Find the missing side. Round to the nearest tenth.**



$$\cos(47) = \frac{x}{30}$$

$$30\cos(47) = x$$

$$x \approx 20.5\text{ft}$$

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When we are trying to find an **angle** we use $\sin^{-1}$, $\cos^{-1}$, or $\tan^{-1}$.

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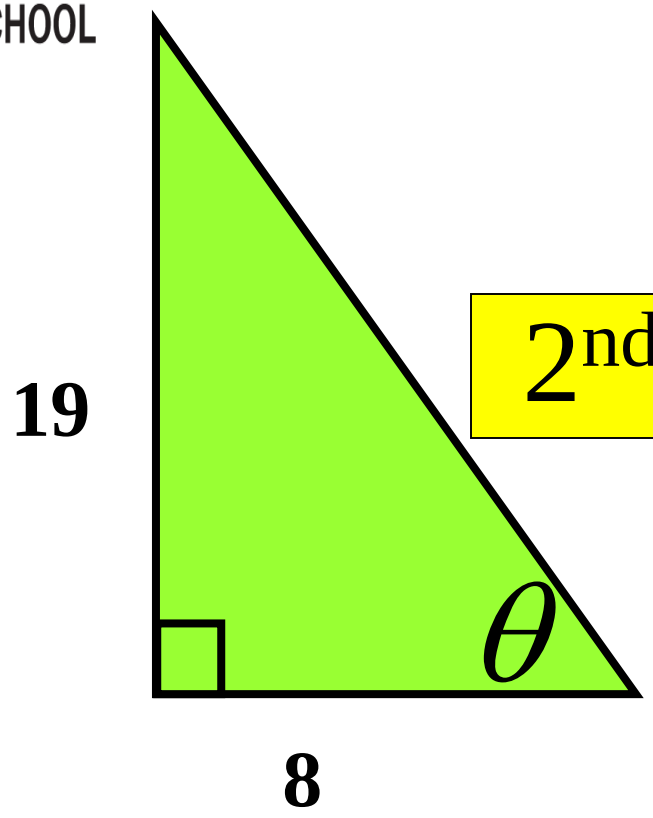
Ex. 1: Find θ. Round to four decimal places.



$$\tan\theta = \frac{19.}{8}$$

2nd	tan	19	÷	8	)

$$\theta \approx 67.1663^\circ$$

Now, figure out which trig ratio you have and set up the problem.

Make sure you are in degree mode (not radians).

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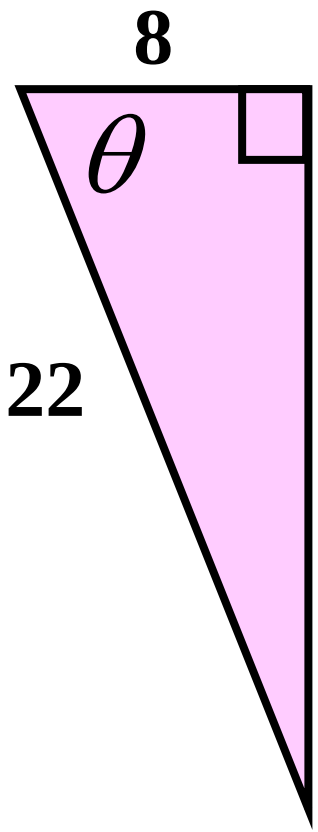
Ex. 2: Find θ. Round to three decimal places.



$$\cos\theta = \frac{8}{22}$$

2^{nd}	cos	8	÷	22	)

$$\theta \approx 68.676°$$

Make sure you are in degree mode (not radians).

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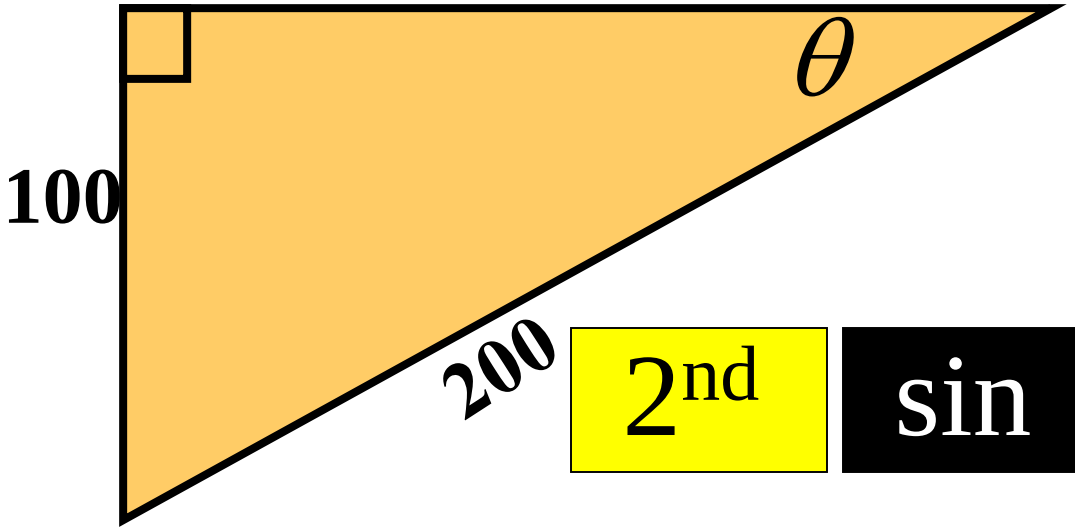
Ex. 3: Find θ. Round to three decimal places.



$$\sin\theta = \frac{100}{200}$$

2^{nd}	sin	100	÷	200	)

$$\theta = 30°$$

Make sure you are in degree mode (not radians).