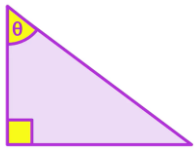
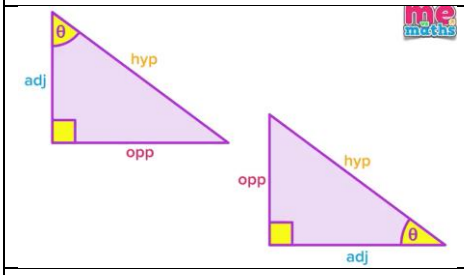
Instructions: Please complete the following questions by researching online and watching video links. Please reach out to your teacher for help or guidance through email or Teams if needed. Live video tutorials are on Teams Wednesdays at 11am and will be recorded and posted on Teams to watch at your convenience.

Trigonometry

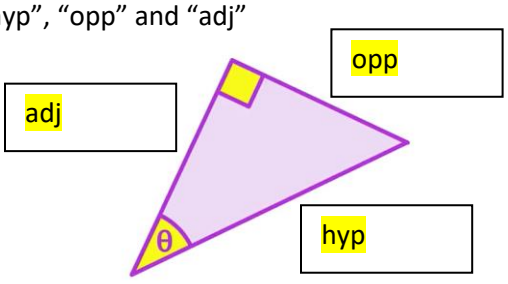
Watch the following videos and fill in the notes / answer the questions.

1. **Labelling sides**

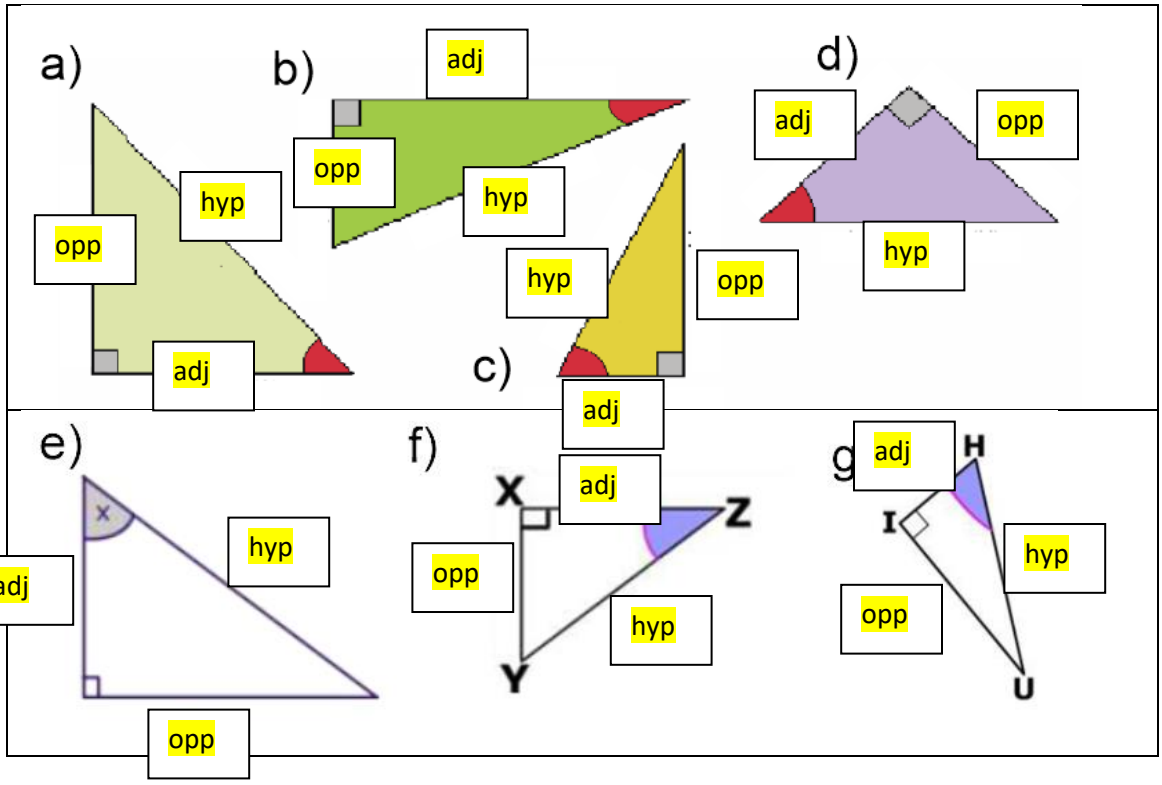
https://www.youtube.com/watch?v=1ALLrv2dQxc

	What type of triangle is this? How do you know? Right triangle – it has a 90° angle
θ	This is the Greek letter called: ___theta_____ It is used as a variable to represent: an angle
'hypotenuse'	It is the ___longest___ side It is always opposite the ____right angle____.
'opposite'	Opposite the angle we're ___looking for_____ or Opposite the angle we ___already know__
'adjacent'	The one "_left over__" The side next to the __right angle___ and the angle involved in the question
	Which side name stayed the same in both triangles? the hypotenuse Why did the "opp" and "adj" sides swap? because the angle involved in the question changed

label the diagram with "hyp", "opp" and "adj"

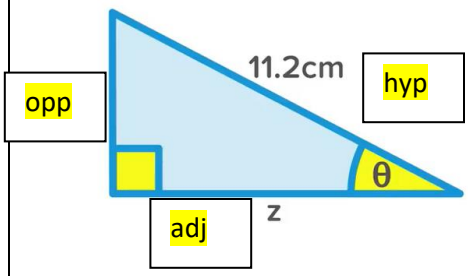
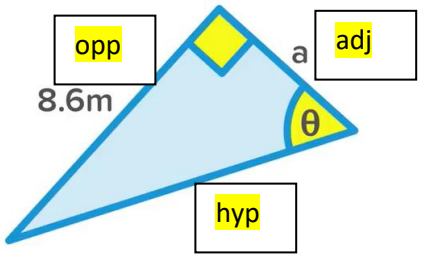


Label the following triangles with "hyp", "opp" and "adj" (in reference to the indicated angle)

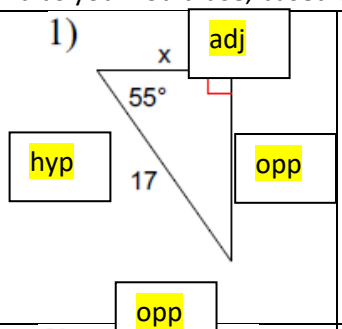
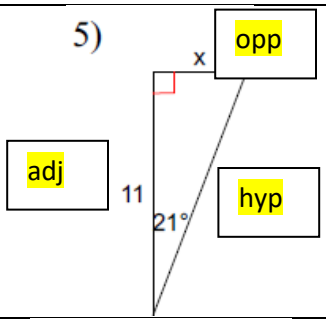
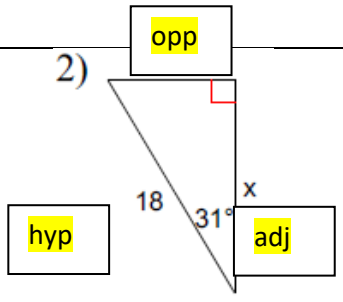
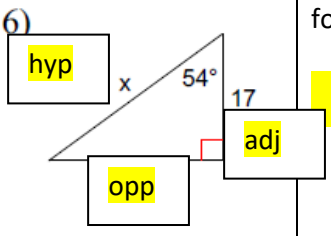
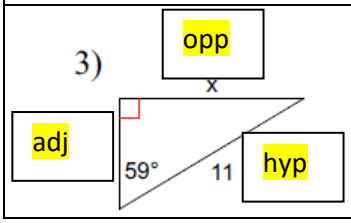
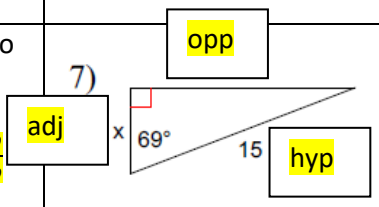


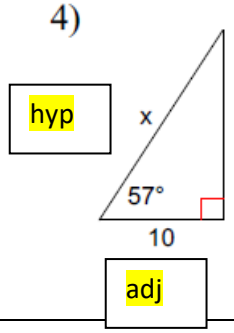
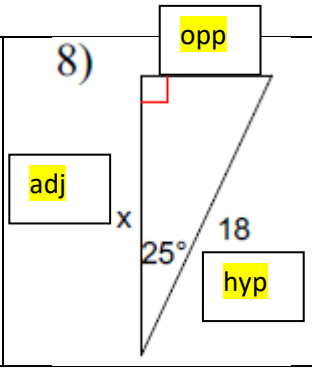
2. **Intro Trig ratios/identities/formulas**
   https://www.youtube.com/watch?v=tKAMM3kacbs

sine sin cosine cos tangent tan 	Find these 3 buttons on your calculator.
$sin\theta = \frac{opposite}{hypotenuse}$ $cos\theta = \frac{adjacent}{hypotenuse}$ $tan\theta = \frac{opposite}{adjacent}$	These are the 3 Trig formulas. What is the phrase used to remember the formulas? **SOH CAH TOA**

Which formula should we use to find side z?  	Label each side (hyp, opp, adj) Which two sides of this triangle are "active"? hyp and adj Which formula uses both of those "active" sides? $\cos\theta=\frac{adj}{hyp}$
Which formula should we use to find side a?  	Label each side (hyp, opp, adj) Which two sides of this triangle are "active"? opp and adj Which formula uses both of those "active" sides? $\tan\theta=\frac{opp}{adj}$

For the following questions, label each side (hyp, opp, adj) and decide which of the three trig formulas you would use, based on the "active" sides.

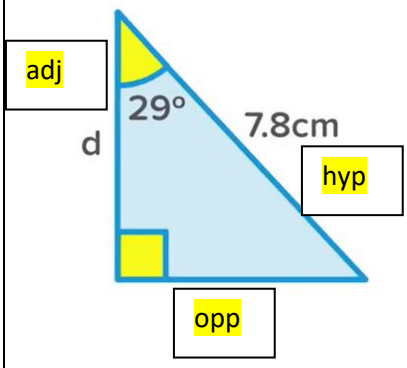
1)  	formula to be used: $\cos\theta=\frac{adj}{hyp}$	5)  	formula to be used: $\tan\theta=\frac{opp}{adj}$
2)  	formula to be used: $\cos\theta=\frac{adj}{hyp}$	6)  	formula to be used: $\cos\theta=\frac{adj}{hyp}$
3)  	formula to be used: $\sin\theta=\frac{opp}{hyp}$	7)  	formula to be used: $\cos\theta=\frac{adj}{hyp}$

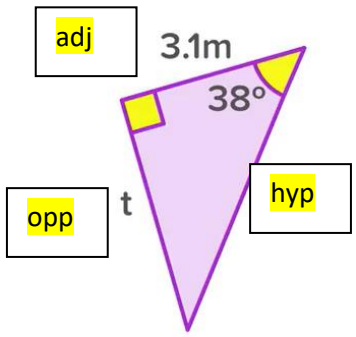
4)  	formula to be used: $\cos\theta=\frac{adj}{hyp}$	8)  	formula to be used: $\cos\theta=\frac{adj}{hyp}$

3. **Finding missing sides**

***** BEFORE YOU START THIS SECTION, AND USING THE SIN COS TAN BUTTONS ON YOUR CALCULATOR, YOU HAVE TO MAKE SURE YOUR CALCULATOR IS IN DEGREE MODE – look for a little D or DEG on your screen, if it shows R or RAD or G or GRAD, hit your "mode" button until it's in degree mode, IF YOU AREN'T IN THE RIGHT MODE, YOUR ANSWERS WILL BE WRONG.**

https://www.youtube.com/watch?v=E7y3ENOSGK4

Find side d (to 1 d.p.)  	Example: Label the sides Which two sides are "active"? adj (because it has the variable "d" and hyp because it has a measurement. formula: $\cos\theta = \frac{adj}{hyp}$ $\cos(29) = \frac{d}{7.8}$ $7.8 \times \cos(29) = d$ $d = 6.8220...$ $= 6.8cm$



Label each side.

Explain why the correct formula is

$$\tan\theta = \frac{\text{opp}}{\text{adj}}$$

because the "active sides" are opp (t) and adj (3.1m)

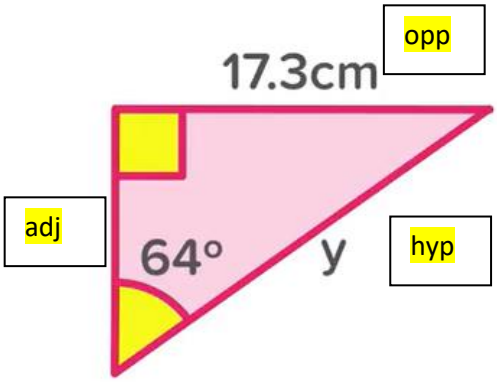
Show the steps of how to get the missing side length "t"

$$\tan\theta = \frac{opp}{adj}$$

$$\tan 38 = \frac{t}{3.1}$$

$$0.7813 = \frac{t}{3.1}$$

t = 2.4 m



Label each side

Explain why the correct formula is

$$\sin\theta = \frac{\text{opp}}{\text{hyp}}$$

because the "active sides" are opp (17.3cm) and hyp (y)

Show the steps of how to get the missing side length "y"

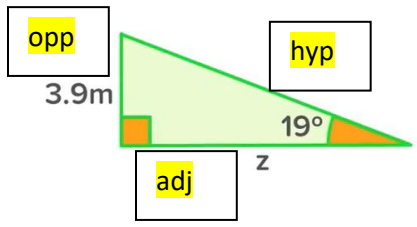
$$\sin\theta = \frac{opp}{hyp}$$

$$\sin 64 = \frac{17.3}{y}$$

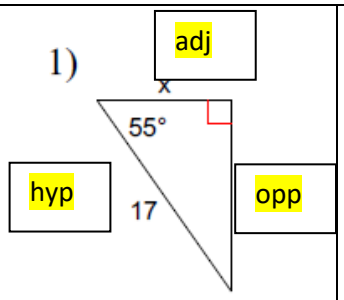
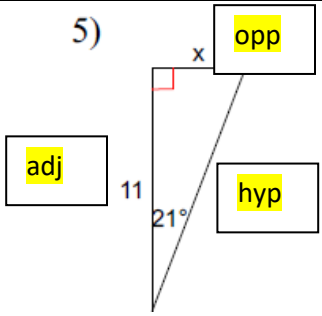
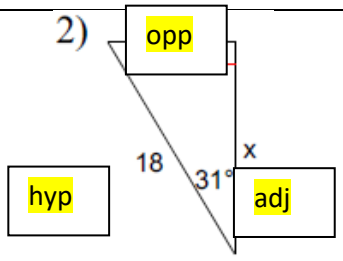
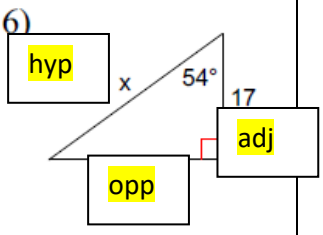
$$0.8988 = \frac{17.3}{y} \text{ or } y = \frac{17.3}{\sin 64}$$

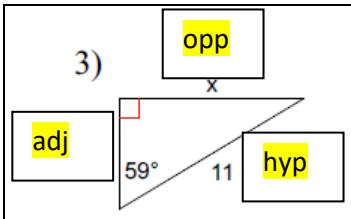
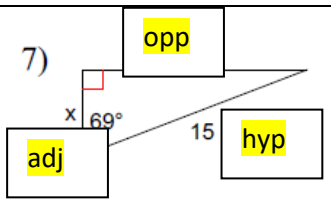
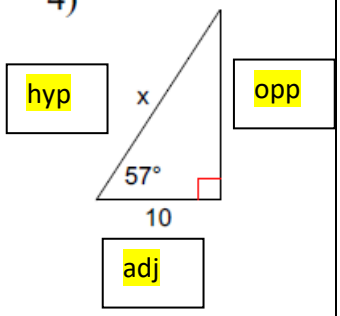
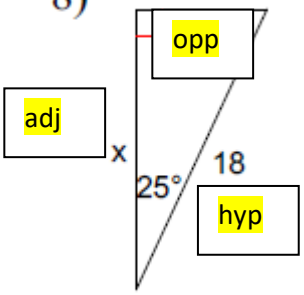
y = 19.2 cm

****note, if you want to do the math a different way (that is still mathematically correct), you can do it your own way. The math shown in the video is a short-cut, short cuts are good, but sometimes confusing. Just make sure you can do it in a way that arrives at the correct answer* 😊

Find z (to 1 d.p.)  	Label each side Explain why the correct formula is $\tan\theta = \frac{\text{opp}}{\text{adj}}$ Show the steps of how to get the missing side length "z" $\tan\theta = \frac{opp}{adj}$ $\tan 19 = \frac{3.9}{z}$ $0.3443 = \frac{3.9}{z}$ or $z = \frac{3.9}{\tan 19}$ **t = 11.3 m**

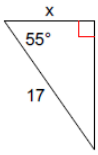
Find the missing side lengths in the following triangles. For every question, label your sides and write your formula. Round answers to one decimal place.

1)  	$\cos\theta = \frac{adj}{hyp}$ $\cos 55 = \frac{x}{17}$ $0.5735 = \frac{x}{17}$ (if you are going to round off like I did, make sure you use at least 4 decimals) x = 9.8	5)  	$\tan\theta = \frac{opp}{adj}$ $\tan 21 = \frac{x}{11}$ $0.3839 = \frac{x}{11}$ x = 4.2
2)  	$\cos\theta = \frac{adj}{hyp}$ $\cos 31 = \frac{x}{18}$ $0.8572 = \frac{x}{18}$ x = 15.4	6)  	$\cos\theta = \frac{adj}{hyp}$ $\cos 54 = \frac{17}{x}$ $x = \frac{17}{\cos 54}$ $x = \frac{17}{0.5879}$ x = 28.9

3)  	$\sin\theta=\frac{opp}{hyp}$ $\sin 59=\frac{x}{11}$ $0.8572=\frac{x}{11}$ x = 9.4	7)  	$\cos\theta=\frac{adj}{hyp}$ $\cos 69=\frac{x}{15}$ $0.3584=\frac{x}{15}$ x = 5.4
4)  	$\cos\theta=\frac{adj}{hyp}$ $\cos 57=\frac{10}{x}$ $x=\frac{10}{\cos 57}$ $x=\frac{10}{0.5446}$ x = 18.4	8)  	$\cos\theta=\frac{adj}{hyp}$ $\cos 25=\frac{x}{18}$ $0.9063=\frac{x}{18}$ x = 16.3

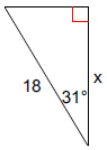
I'm going to post the answers (without the work) below so you know if you did the questions correctly or not.

1)



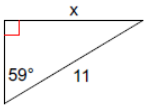
9.8

2)



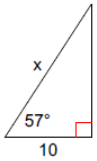
15.4

3)



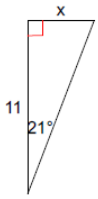
9.4

4)



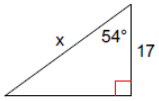
18.4

5)



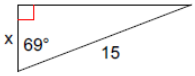
4.2

6)



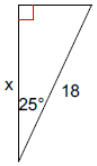
28.9

7)



5.4

8)



16.3