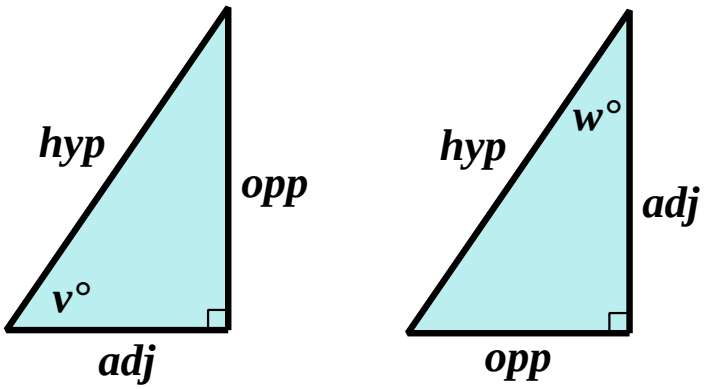
Lesson 2

Trigonometry : Year 9

2.1 Recap

To label a right-angled triangle;

First	*hyp*	Look for the *right-angle*. The *hypotenuse* does not touch the *right-angle*.
Second	*opp*	Look for the *angle-of-focus*. The *opposite* does not touch the *angle-of-focus*.
Third	*adj*	The *adjacent* touches both the *right-angle* and the *angle-of-focus*.



Notice how the *opp* and *adj* flip when the *angle-of-focus* changes from $v°$ to $w°$.

We'll refer to SOH CAH TOA as *the GET YOUR TRIGONOMETRY CORRECT word*.

It helps you to remember three formulae to work out the *angle-of-focus*.
For example, in the left hand triangle;

$$v° = arcsin\left(\frac{Opp}{Hyp}\right) \qquad v° = arccos\left(\frac{Adj}{Hyp}\right) \qquad v° = arctan\left(\frac{Opp}{Adj}\right)$$

2.2 Exercise

Question 1

Calculate the size of angles $v°$, $w°$ and $x°$, where;

$$v° = arcsin\left(\frac{14.9}{62.6}\right) \qquad w° = arccos\left(\frac{55}{61}\right) \qquad x° = arctan\left(\frac{97.1}{12.6}\right)$$

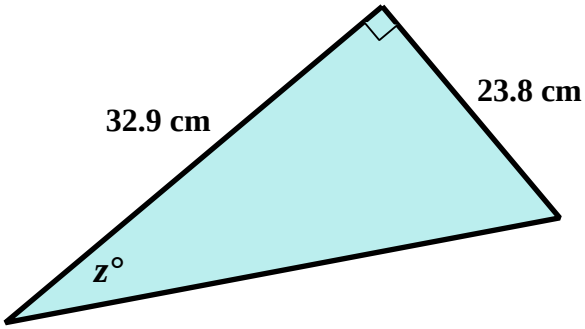
Question 2

Suppose I have a *right-angled* triangle containing an *angle-of-focus k*°.

(a) Without looking anything up try to write down
the GET YOUR TRIGONOMETRY CORRECT word.

(b) Now try to write down three formulas that would let you find angle *k*.
Again, try to do this without looking anything up.

Question 3

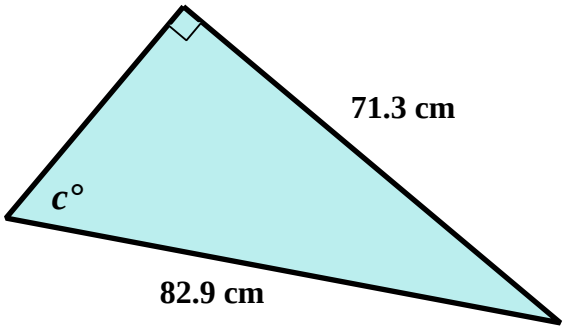


(a) Label the triangle's sides *hyp*, *opp* and *adj*.

(b) Write down *the GET YOUR TRIGONOMETRY CORRECT word*.

(c) Find angle *z*° by using the formula that involves *arctan*

Question 4

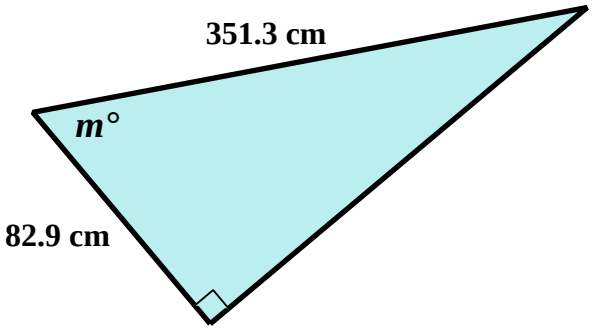


(a) Label the triangle's sides *hyp*, *opp* and *adj*.

(b) Write down *the GET YOUR TRIGONOMETRY CORRECT word*.

(c) Find angle *c*° by using the formula that involves *arcsin*

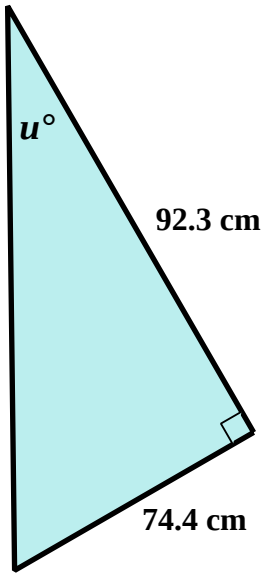
Question 5



(a) Label the triangle's sides *hyp*, *opp* and *adj*.
(b) Write down *the GET YOUR TRIGONOMETRY CORRECT word*.

(c) Find angle $m°$ by using the formula that involves *arccos*

Question 6

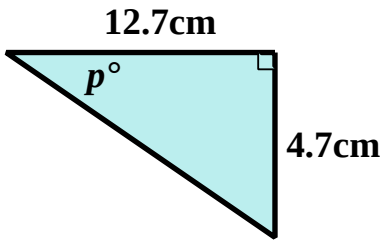


(a) Label the triangle's sides *hyp*, *opp* and *adj*.
(b) Write down *the GET YOUR TRIGONOMETRY CORRECT word*.

(c) Find angle $u°$ by using the appropriate formula.

Question 7

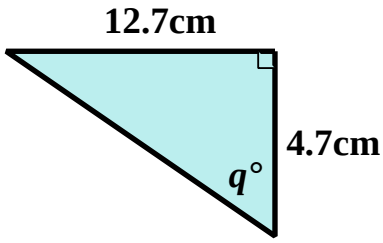
(a)



(i) Label the triangle's sides, *hyp*, *opp* and *adj*.

(ii) Calculate angle p by using the appropriate formula.

(b)



(i) Label the triangle's sides, *hyp*, *opp* and *adj*.

(ii) Calculate angle q by using the appropriate formula.

(c) **(i)** Calculate $p° + q°$

(ii) Explain how this suggests that your answers are correct.

Question 8

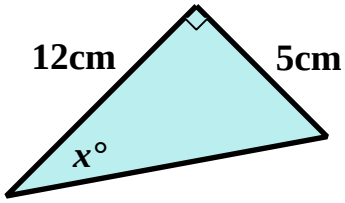
Calculate the size of angles $Y°$, $X°$ and $U°$, where;

$$Y° = arcsin\left(\frac{4.9 + 3.5}{32.6}\right)$$

$$X° = arccos\left(\frac{45}{21 + 38}\right)$$

$$U° = arctan\left(\frac{94}{72} + \frac{18}{23}\right)$$

Question 9



(a) Label the triangle's sides, *hyp*, *opp* and *adj*.

(b) Calculate angle $x°$ by using the formula that involves *arctan*

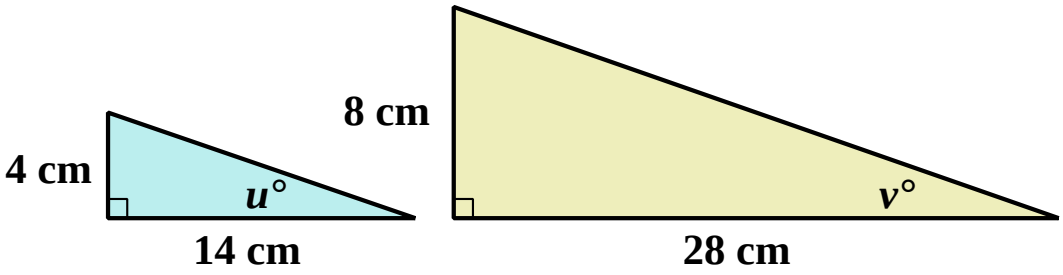
(c) Use Pythagoras' theorem to calculate the length of *hyp*.

$$hyp^2 = opp^2 + adj^2$$

(d) Calculate angle $x°$ by using the formula that involves *arcsin*

(e) Calculate angle $x°$ by using the formula that involves *arccos*

Question 10



(a) Calculate angles *u* and *v*.

(b) Explain the connection between your answers.