

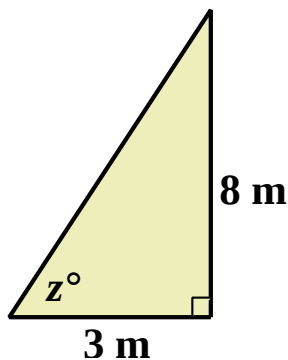
Lesson 4

Coordinate Geometry : Year 9

Calculator needed !

4.1 Opposite and Adjacent

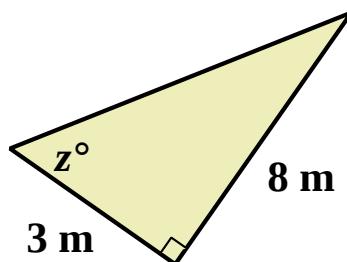
Nice example



Find the angle of the slope, z° , by using the formula;

$$z = \arctan \left(\frac{\Delta y}{\Delta x} \right)$$

Obviously the same problem



However, it does not seem right to call the 3 m Δx or the 8 m Δy .

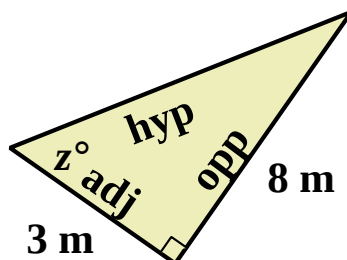
HYPOTENUSE is the side which does not touch the *right-angle*.

OPPOSITE is the side which does not touch z° , the *angle-of-focus*.

ADJACENT is the side which touches the *right-angle* and also z° , the *angle-of-focus*.

Thus;

$$z = \arctan \left(\frac{opp}{adj} \right)$$

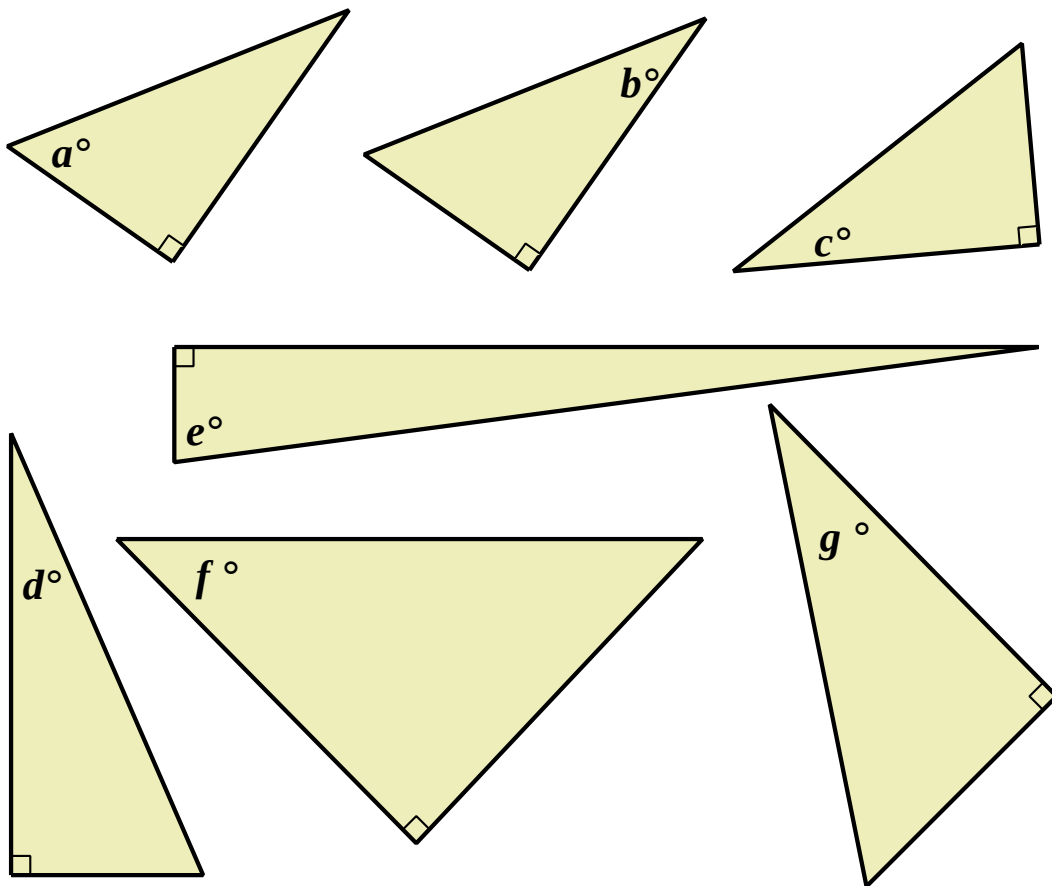


4.2 Exercise

Question 1

On each of the following triangles add the following labels;

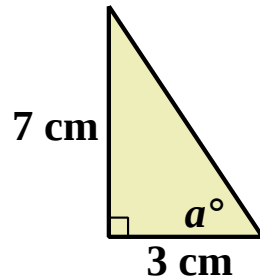
- First** *hyp* Look for the *right-angle*.
The *hypotenuse* does not touch the right-angle.
- Second** *opp* Look for the *angle-of-focus*.
The *opposite* does not touch the *angle-of-focus*.
- Third** *adj* The *adjacent* touches both the *right-angle*
and the *angle-of-focus*.



Question 2

- (i) Label the triangle's sides, *hyp*, *opp* and *adj*.
- (ii) Calculate angle a by using the formula;

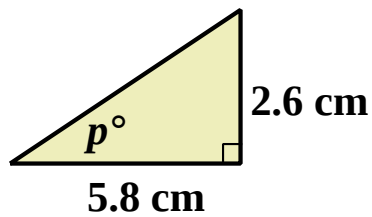
$$a = \arctan\left(\frac{\text{opp}}{\text{adj}}\right)$$



Question 3

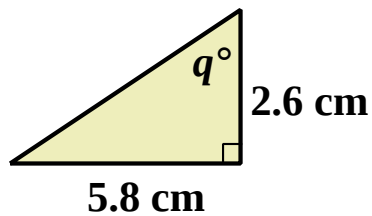
- (a) (i) Label the triangle's sides, *hyp*, *opp* and *adj*.
- (ii) Calculate angle p by using the formula;

$$p = \arctan\left(\frac{\text{opp}}{\text{adj}}\right)$$



- (b) (i) Label the triangle's sides, *hyp*, *opp* and *adj*.
- (ii) Calculate angle q by using the formula;

$$q = \arctan\left(\frac{\text{opp}}{\text{adj}}\right)$$

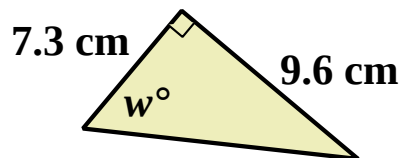


- (c) (i) Calculate $p^\circ + q^\circ$
- (ii) Explain how this checks that your answers are correct.

Question 4

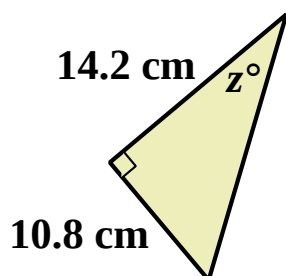
- (i) Label the triangle's sides, *hyp*, *opp* and *adj*.
- (ii) Calculate angle w by using the formula;

$$w = \arctan\left(\frac{\text{opp}}{\text{adj}}\right)$$



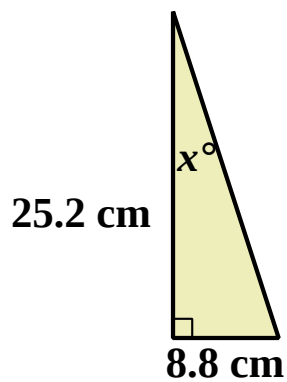
Question 5

- (i) Calculate angle z .
- (ii) Give your answer to one decimal place.



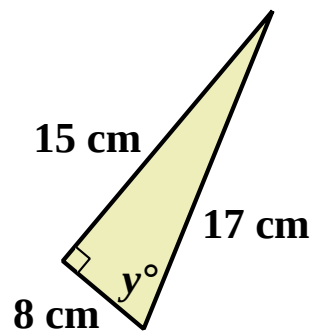
Question 6

- (i) Calculate angle x .
- (ii) Give your answer to one decimal place.



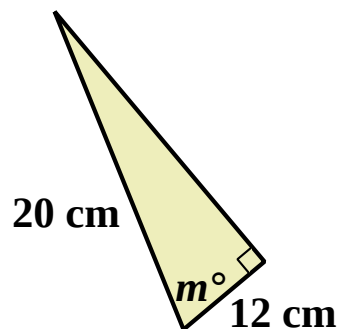
Question 7

- (i) Calculate angle y .
- (ii) Give your answer to one decimal place.



Question 8

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



Pythagoras' theorem tells us that;

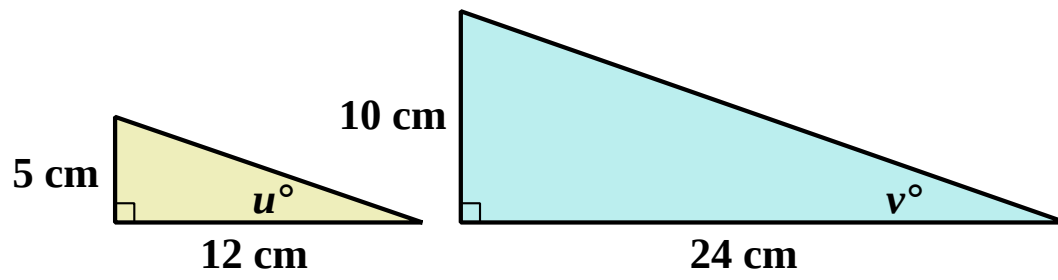
$$opp^2 = hyp^2 - adj^2$$

- (ii) Use Pythagoras' theorem to calculate the length of *opp*.

- (iii) Calculate angle m by using the formula;

$$m = \arctan\left(\frac{opp}{adj}\right)$$

Question 9



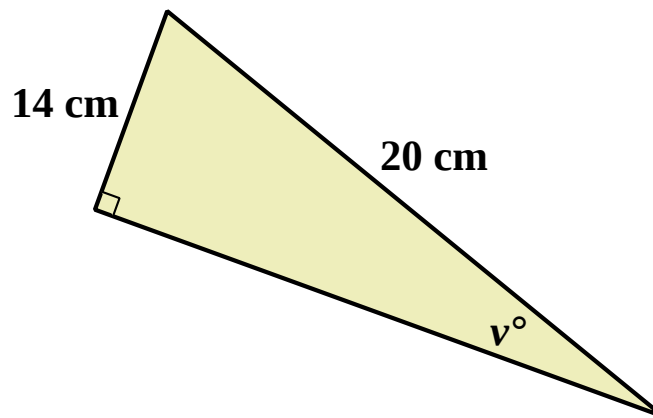
(i) Calculate angle u .

(ii) Calculate angle v .

(ii) Can you explain the connection between your answers ?

Question 10

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



Pythagoras' theorem tells us that;

$$adj^2 = hyp^2 - opp^2$$

- (ii) Use Pythagoras' theorem to calculate the length of *adj*.

- (iii) Calculate angle *v* by using the formula;

$$v = \arctan\left(\frac{opp}{adj}\right)$$