

Sangam Skm College – Nadi 2021
Lesson Notes Week 1
Year 10
Mathematics

Strand 4: Geometry

Sub Strand: Trigonometry

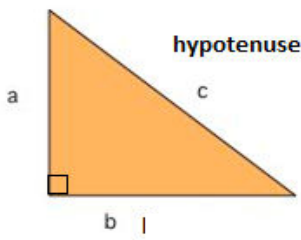
Content Learning Outcome: At the end of this lesson students should be able to:

1. identify the longest side as the hypotenuse.
2. use the Pythagoras Theorem ($c^2 = a^2 + b^2$) to find the length of the unknown side.
3. use the calculator and find both the squares and square roots.

Lesson Notes

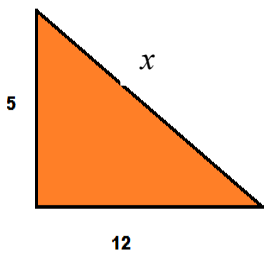
- Trigonometry means ratios of sides of triangles.
- Pythagoras Theorem gives the relationship between the sides of a right-angled triangle.
i.e. $c^2 = a^2 + b^2$

where: **c** refers to the longest side of the right-angled triangle, and it will always be opposite the right angle
a and **b** are the other two sides of the triangle.

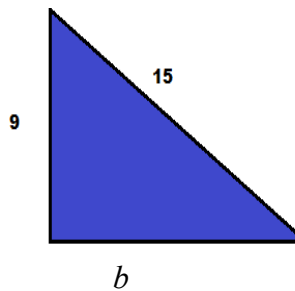


- The theorem can also be used to determine whether a triangle is a right-angled triangle or not.

Example: find the unknown side of the following triangles given below:



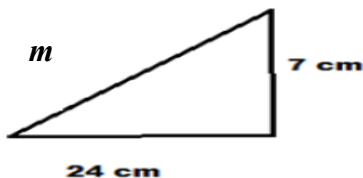
$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 5^2 + 12^2 &= x^2 \\
 25 + 144 &= x^2 \\
 169 &= x^2 \\
 x^2 &= 169 \\
 x &= \sqrt{169} \\
 x &= 13
 \end{aligned}$$



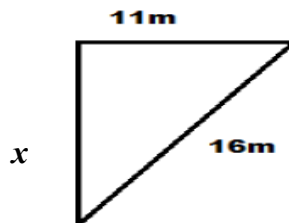
$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 9^2 + b^2 &= 15^2 \\
 81 + b^2 &= 225 \text{ Taking 81} \\
 &\text{away from both sides gives} \\
 \cancel{81} + b^2 - \cancel{81} &= 225 - 81 \\
 b^2 &= 144 \\
 b &= \sqrt{144} \\
 b &= 12
 \end{aligned}$$

Activity

1. Find the missing sides
(a)



(b)



2. A 3m ladder stands on a horizontal ground and reaches 2.8m up a vertical wall. How far is the foot of the ladder from the base of the wall?

Sangam Skm College – Nadi
Lesson Notes Week 2
Year 10
Mathematics

Strand 4: Geometry

Sub Strand: Trigonometry

Content Learning Outcome: At the end of this lesson students should be able to:

1. determine whether a triangle is a right-angled triangle or not. (Pythagorean Traid)
2. identify the sides of the right angled (hypotenuse, opposite, adjacent)

PYTHAGOREAN TRAIID

- Given the sides of any triangle you can determine whether it is a right-angled triangle or not using the Pythagoras theorem. i.e. $c^2 = a^2 + b^2$.
- the largest number squared should equal the addition of the other two sides squared.

Example: show whether the following is a right-angled triangle or not.

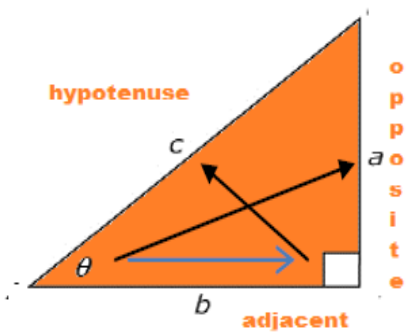
a. **3, 4, 5**
 $5^2 = 3^2 + 4^2$
 $25 = 9 + 16$
 $25 = 25$

Since the above is equal,
it is a right angled triangle

b. **6, 11, 8**
 $11^2 = 6^2 + 8^2$
 $121 = 36 + 64$
 $121 \neq 100$

since the above is not equal ,
it is **not** a right angled triangle

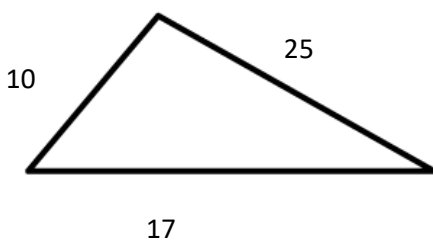
- In trigonometry the Greek letter Θ (theta) is used as the name of an angle.
- Using Θ the sides of the triangle can be named as below



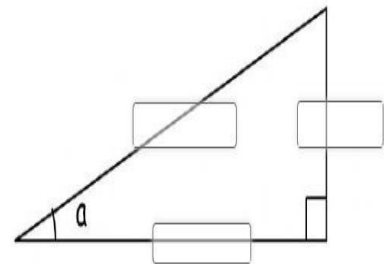
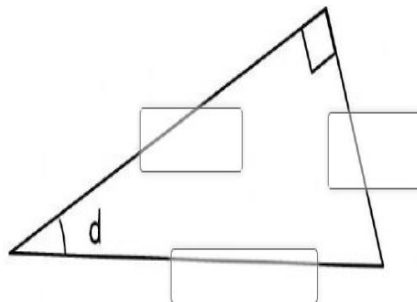
- The **hypotenuse** will always be the longest side and always opposite the 90°
- **Adjacent** is always close to the theta
- **Opposite** will always be opposite the theta.

Activity

1. Prove whether the following is a right angled triangle or not.



2. Label the following sides of right-angled triangle.



Sangam Skm College – Nadi
Lesson Notes Week 3
Year 10
Mathematics

Strand 4: Geometry

Sub Strand: Trigonometry

Content Learning Outcome: At the end of this lesson students should be able to:

1. find the missing sides of the right-angled triangle using the trigonometry function i.e. SOH CAH TOA
2. use the calculator and find the missing length

TRIGONOMETRIC RATIO

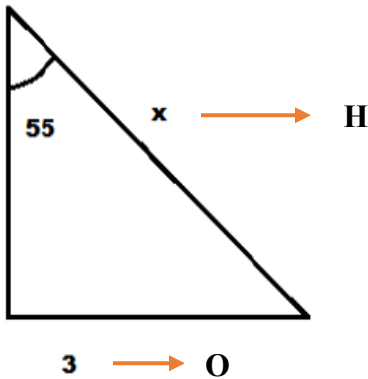
- To find the missing side: label the sides given only (A – adjacent , O – opposite, H – hypotenuse)
: identify the formula to be used i.e.

$$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$$

Example: find the missing side



Since we have the sides H , O we can use the formula

$$\sin \theta = \frac{o}{h}$$

$$\sin 55 = \frac{3}{x}$$

$$x \sin 55 = \frac{3x}{x} \quad \text{multiply } x \text{ on both sides}$$

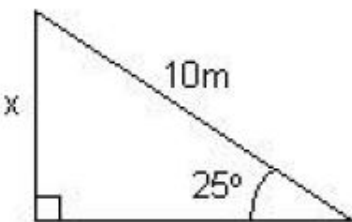
$$x \frac{\sin 55}{\sin 55} = \frac{3}{\sin 55} \quad \text{divide by } \sin 55 \text{ on both sides}$$

$$\underline{x = 3.66}$$

Activity

Find the value of the missing side.

a.



b.



c.

