



3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj



WORKSHEET 7

SCHOOL : BA SANGAM COLLEGE

YEAR : 10

SUBJECT: MATHEMATICS

NAME OF STUDENT: _____

STRAND	4- GEOMETRY
SUB-STRAND	PYTHAGORAS THEOREM
LEARNING OUTCOME	<ul style="list-style-type: none"> Use this relationship to find the unknown sides of a right - angled triangle.

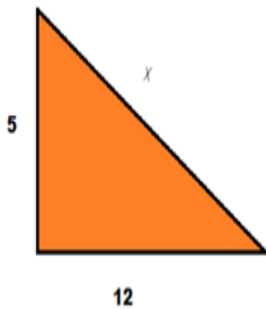
- Pythagoras Theorem** Is a theorem that gives the relationship between the sides of a right - angled triangle. This theorem is used to find a missing side of a right-angle triangle given any other two sides

$$a^2 + b^2 = c^2$$

where: c is the longest side of the triangle called the hypotenuse

a and b are the other two sides of the triangle

EXAMPLE : Find the **missing side x** from the triangle given below



Solution

$$a^2 + b^2 = c^2$$

$$5^2 + 12^2 = x^2$$

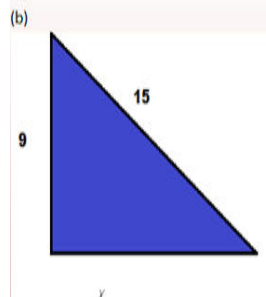
$$25 + 144 = x^2$$

$$169 = x^2$$

$$x^2 = 169$$

$$x = \sqrt{169}$$

$$x = 13$$



Solution

$$a^2 + b^2 = c^2$$

$$9^2 + b^2 = 15^2$$

$$81 + b^2 = 225 \text{ Taking } 81 \text{ away from both sides gives}$$

$$81 + b^2 - 81 = 225 - 81$$

$$b^2 = 144$$

$$b = \sqrt{144}$$

$$b = 12$$

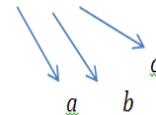
(c) A triangle has lengths 8, 15 and 16. Is it a right angled triangle?

Solution

$$a^2 + b^2 = c^2$$

$$8^2 + 15^2 = 289$$

$$8, 15, 16$$



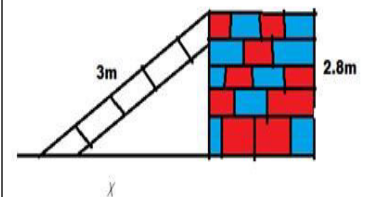
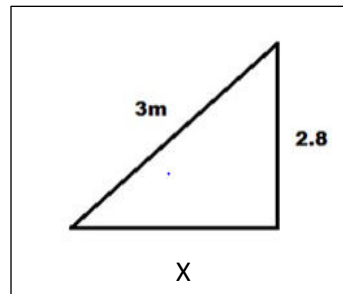
$$16^2 = 256$$

since $a^2 + b^2$ is not equal to c^2 ($a^2 + b^2 \neq c^2$)

therefore the given triangle is not a right - angled triangle.

Example (word problem)

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?



SOLUTION

Using the Pythagoras theorem $a^2 + b^2 = c^2$ to calculate the value of x. Let $a = x$, $c = 3m$ and $b = 2.8m$.

$$a^2 + b^2 = c^2$$

$$x^2 + (2.8)^2 = 3^2$$

$$x^2 + 7.84 = 9$$

$$x^2 + 7.84 - 7.84 = 9 - 7.84$$

$$x^2 = 1.16$$

$$\sqrt{1.16}$$

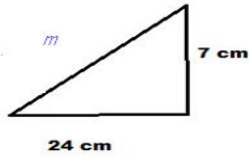
$$x = 1.08$$

Exercise

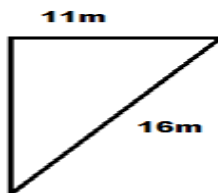
1. Find the missing sides

(2 marks each)

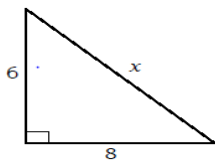
(a)



(b)



(c)



2. The side lengths of various triangles are given. Determine which ones are right angled triangles. (2 marks each)

a) {6, 8, 10}

b. $\sqrt{3}$ $\sqrt{11}$ $\sqrt{8}$

c) {3, 5, 6}

3.

A rectangular field is 125 m long and the length of one diagonal of the field is 150m. What is the width of the field?

(2 marks)

5. Linda is mountain climbing with Allie and has just climbed a 16-metre vertical rock face. Allie is standing 12 metres away from the bottom of the cliff, looking up at Linda. How far away are Linda and Allie?

(2 marks)

4. A 8 meters ladder is leaned against the side of a wall. How high does the ladder reach if its base is 3 meters away from the building?

(2 marks)

6. A 12m ladder is leaned against the side of a wall. If the wall is 5m high then how far the ladder is from the base of the building?

(2marks)