



## JOB OPPORTUNITY

### Announcement of Sainampeung School

#### Roster for the Position of the Mathematics Teacher

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With reference to the job vacancy published on 10<sup>th</sup> March 2023, where Sainampeung School announced the need for applicants for Mathematics Teachers to teach students of Sainampeung School in Academic Year 2023.

Sainampeung School hereby announces the shortlist of applicants eligible for a teaching demonstration and interview, for the position of Mathematics Teacher.

1. The shortlisted applicants are as follows.

1. Mr. Peter Onyemaechi Uche
2. Mr. Chima Kenneth Ugonabo
3. Mrs. Maria Mercedes Del Rosario
4. Mr. Muzaffar Ali
5. Ms. Ligaya Rabara Sanchez
6. Mr. Georgy Beloglazov
7. Ms. Ardra Asok
8. Ms. Kharene Mae Zonio

2. The details of the teaching demonstration and interview are as follows:

The teaching demonstration and interview will be held on **Thursday, 23<sup>rd</sup> March 2023, from 09.00 AM onwards, at Sainampeung School.**

2.1 Registration of the teaching demonstration will be from 08.30 AM to 09.00 AM at Room 8303 (Building 8 on the 3<sup>rd</sup> floor). Applicants who do not register during this specified time will be disqualified. The order of teaching demonstration will be according to the order of the registration.

2.2 Applicants must conduct the teaching demonstration for 15 minutes, on the Pythagorean Theorem using the following given material (*Attached File No. 1*). Applicants are allowed to give additional exercises if need be.

2.3 Teaching demonstration will be done with Grade 8 students (Mathayom 2) from the Mini English Program.

2.4 A computer, Wi-Fi connection, whiteboard, markers, projector and interactive board are provided. You are welcome to bring your own laptop or iPad, but please bring your own connectors as we have HDMI and VGA ports.

### 3. Required Documents:

3.1 Three (3) copies of lesson plans (50-minute lesson plan)

3.2 Original credentials for any required documents (i.e., Passport/ID Card, transcript of records, teaching license, etc.)

3.3 Portfolio (if any)

### 4. Criteria

Accepted applicant must garner a score of at least sixty percent (60%) based on the criteria for the teaching demonstration and the interview. The criteria for teaching demonstration and the interview are shown as Attached File No. 2 and 3 respectively.

### 5. Successful Candidate Announcement

Sainampeung School will announce the successful candidates on 27<sup>th</sup> March 2023, and will be posted on the school website. ([www.sainampeung.ac.th](http://www.sainampeung.ac.th))

This announcement is made this 20<sup>th</sup> March, 2023



**( Mr. Narongsak Rakphra )**

Director

Sainampeung School

20<sup>th</sup> March 2023



# UNIT 01

## PYTHAGOREAN THEOREM

### Learning Contents



Biography of Pythagoras

Pythagorean Theorem

• Proof of the Pythagorean theorem

Converse of Pythagoras

• Proof of the converse of Pythagorean theorem

Applying the Pythagorean Theorem



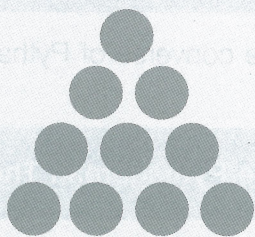
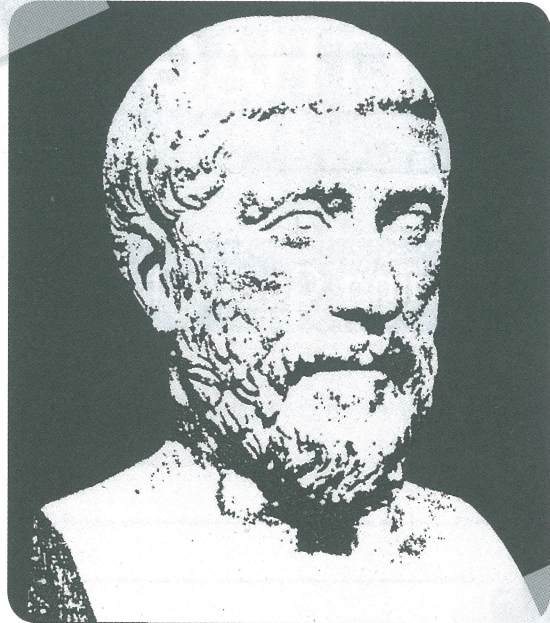
# 1 Biography of Pythagoras

**Pythagoras** was a Greek mathematician. He was born on Samos, the Greek island in the eastern Aegean. He got experience and knowledge from his travelling to Egypt and Babylonia. When he stayed in Egypt, he observed the wisdom of Egyptians. The Egyptians knotted a rope 13 times around 3 wooden poles to measure area. Therefore, this triangle is a right triangle.

After his travelling, Pythagoras moved to Croton, Italy, because Samos was occupied by Persia and he established the Pythagorean School, which is famous for philosophy, mathematics and natural science (considered a modern science in that period).

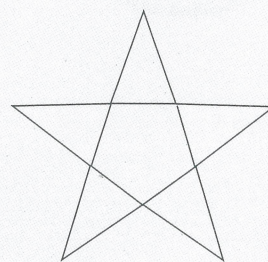
The philosophy of Pythagoras is, "Numbers rule the universe." Pythagoras also believed that any quantities in the physical world can be written using counting numbers, which later became his school's motto, "All is number."

The symbol of the Pythagorean school is an equilateral triangle, which is made up of 10 circles.



Each triangle's sides is 4 circles long, and the total are:

$$1 + 2 + 3 + 4 = 10 \text{ circles}$$



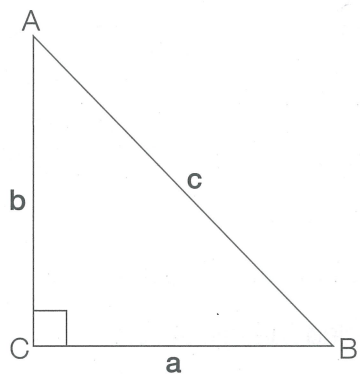
There are many ideas from the Pythagorean school that are unique from others. For example, refusing to eat beans and wine, not picking up things that are dropped and not using fireplace pokers.



However, the belief of Pythagoras in only counting numbers was later challenged by their own findings of “irrational numbers.” Also, the school faced problems with local officials regarding land.

In a way, the Pythagoreans were famous for knowing that any triangle with sides in the ratio 3 : 4 : 5 is a “right-angled triangle”. So far, they were known as the first people to prove it.

## 2 Pythagorean Theorem



If  $\triangle ABC$  is a right-angled triangle;  $\hat{A}CB$  is the right angle,  $c$  represents the length of the side opposite to the right angle, and  $a$  and  $b$  represent the length of the legs.

We can sum up the relationship between  $a$ ,  $b$  and  $c$  as “ $c^2 = a^2 + b^2$ ”.

From the picture, the square area on the  $c$  side is 25 square units, the square area on the  $a$  side is 16 square units, and the square area on the  $b$  side is 9 square units.

That will be  $5^2 = 16 + 9$

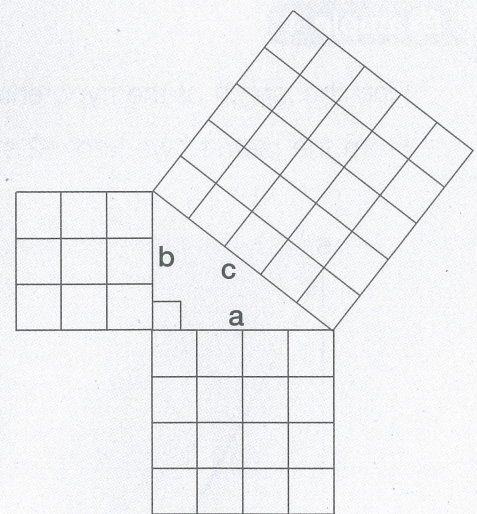
$$5^2 = 4^2 + 3^2$$

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

So, the overall square area between  $a$  and  $b$  is equal to  $c$  square area.

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

When  $a$ ,  $b$  and  $c$  are positive integers.





Example of the relation between three sides of right-angled triangles

a	b	c	a <sup>2</sup>	b <sup>2</sup>	c <sup>2</sup>
3	4	5	9	16	25
5	12	13	25	144	169
7	24	25	49	576	625
9	40	41	81	1,600	1,681
10	24	26	100	576	676
11	60	61	121	3,600	3,721
13	84	85	169	7,056	7,225
60	45	75	3,600	2,025	5,625
72	65	97	5,184	4,225	9,409
3,456	3,367	4,825	11,943,936	11,336,689	23,280,625

From the above table, we can see the relationship among three sides of right angled triangles, is  $c^2 = a^2 + b^2$ .

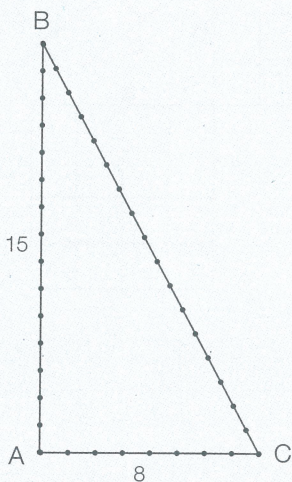
### Remark

To conclude, the **Pythagorean Theorem** is “For a right-angled triangle, the length of the **hypotenuse** is equal to the sum of the squares on the other two sides.”

### Example 1

Find the length of the hypotenuse.

From the picture, we know 2 sides are AC (8 units) and AB (15 units).



### Solution

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

$$BC^2 = AC^2 + AB^2$$

AC side is 8 units and AB side is 15 units.

$$BC^2 = 8^2 + 15^2$$

$$= 64 + 225$$

$$= 289$$

$$= 17^2$$

$$BC = \pm 17$$

As the length must be a positive integer.

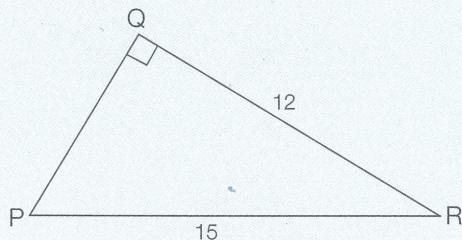
So, the hypotenuse is 17 units.



**Example 2**

Find the unknown side.

From the picture, the value of 2 sides are 15 units (PR) and 12 units (QR).



**Solution**  $\triangle PQR$  has  $\hat{PQR}$  as the right angle.

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

$$PR^2 = PQ^2 + QR^2$$

PR side is 15 units and QR side is 12 units.

$$15^2 = PQ^2 + 12^2$$

$$PQ^2 = 15^2 - 12^2$$

$$= 225 - 144$$

$$= 81$$

$$= 9^2$$

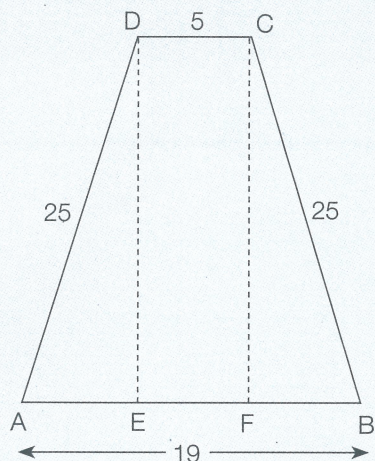
$$PQ = \pm 9$$

As the length must be a positive integer.

So, PQ is 9 units.

**Example 3**

Find the area of the trapezium.



**Solution** From the picture, the length of AB is 19 units, the length of DC is 5 units, AD and BC lengths are 25 units.

$$AB = AE + EF + FB$$

$$(AB = 19, EF = DC = 5, AE = FB)$$

$$19 = 2AE + 5$$

$$14 = 2AE$$

$$AE = 7$$

$\triangle CFB$  is identical to  $\triangle AED$ , which is a right-angled triangle.

So, we'll find the length of DE is the same as CF.



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

$$25^2 = 7^2 + (DE)^2$$

$$625 = 49 + (DE)^2$$

$$(DE)^2 = 625 - 49$$

$$(DE)^2 = 576$$

$$(DE)^2 = 24^2$$

$$DE = \pm 24$$

As the length must be a positive integer.

So,  $DE = 24$  units.

Finally, we can find the area of trapezium.

$$\text{Area of trapezium} = \frac{1}{2} \times (\text{base1} + \text{base2}) \times \text{height}$$

\*\* (base1 and base2 are parallel side of trapezium.) \*\*

$$= \frac{1}{2} \times (5 + 19) \times 24$$

$$= \frac{1}{2} \times 24 \times 24$$

$$= 288$$

So, the area of this trapezium is 288 square units.

### Extra

About 4,000 years ago, after the Pythagorean Theorem, a group of Babylonians discovered the relationship of Pythagoras in 3 dimensions,

$a^2 + b^2 + c^2 = d^2$  when  $a$ ,  $b$ ,  $c$  and  $d$  are positive integers.

$$\text{For example, } 2^2 + 3^2 + 6^2 = 7^2$$

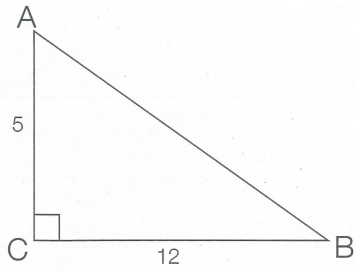
$$\text{and } 5^2 + 6^2 + 30^2 = 31^2$$



# EXERCISE 1

1. Find the length of hypotenuse.

1)




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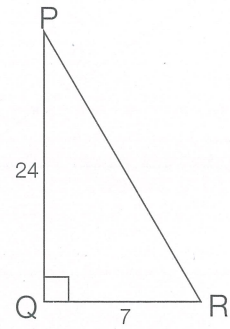
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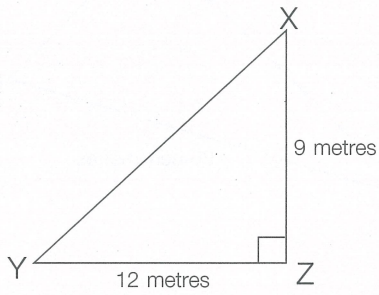
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3)




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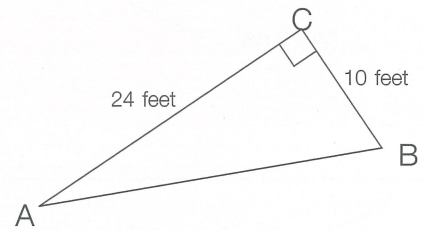
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4)




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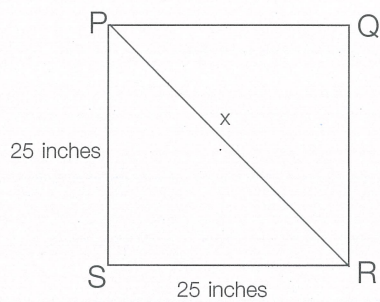
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5) Determine  $\sqrt{2} \approx 1.414$




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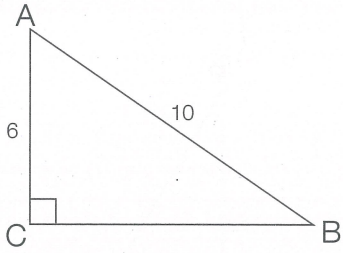
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2. Find the unknown side.

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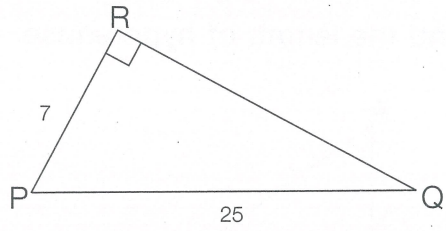
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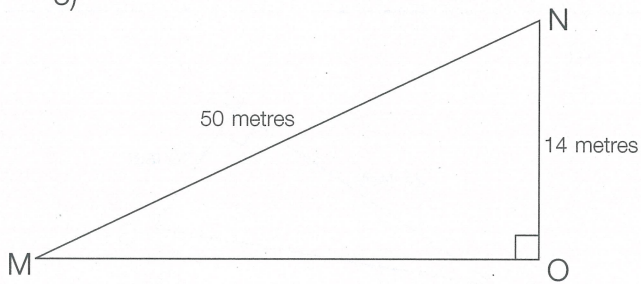
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3)



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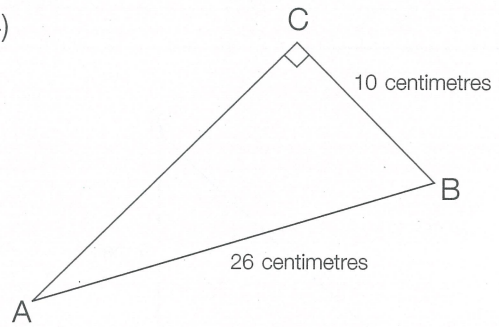
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4)



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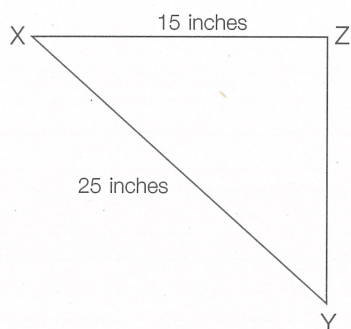
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5)



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## Teaching Demonstration Evaluation Form (100 points)

Applicant's Name \_\_\_\_\_

	Criteria	Marks	Remarks
1.	<b>Personality</b> (10 marks) <ul style="list-style-type: none"> <li>- Attire and Presentation</li> <li>- Gestures</li> <li>- Facial Expression</li> </ul>		
2.	<b>Lesson Plan</b> (20 marks) <ul style="list-style-type: none"> <li>- Strand/Standard(s) /criteria</li> <li>- Objective(s) &amp; Learning Outcome(s)</li> <li>- Instructional Procedures</li> <li>- Materials</li> <li>- Evaluation / Assessment</li> </ul>		
3.	<b>Instructional Techniques and Strategies</b> (30 marks) <ul style="list-style-type: none"> <li>- Introduction and warm up</li> <li>- Teaching methods and strategies appropriate to the students' level</li> <li>- Appropriate instructional materials</li> <li>- Evaluation relevant with objectives</li> <li>- Class management</li> <li>- Time management</li> </ul>		
4.	<b>Language Proficiency</b> (10 marks)		
5.	<b>Ability to engage and connect with students</b> (10 marks)		
6.	<b>Interview</b> (20 marks)		
	<b>Total</b>		

Note:.....

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Signature.....

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## Criteria for Qualification of the applicants (20 points)

Applicant's Name \_\_\_\_\_

	Criteria	Rating		
		5	3	0
1	Teaching License from Teacher's Council of Thailand or Kurusapa	With Teaching License	In the process of getting Teaching License	None shown
2	Degree in education or related field	With degree in education	With degree related to field of education	No degree in education or related field
3	Teaching experience in Thailand	More than 2 years	1 -2 years	Less than 1 year
4	Mathematics Depth of Knowledge	Excellent	Good	Poor
	<b>Total</b>			

Note: .....

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Signature.....

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