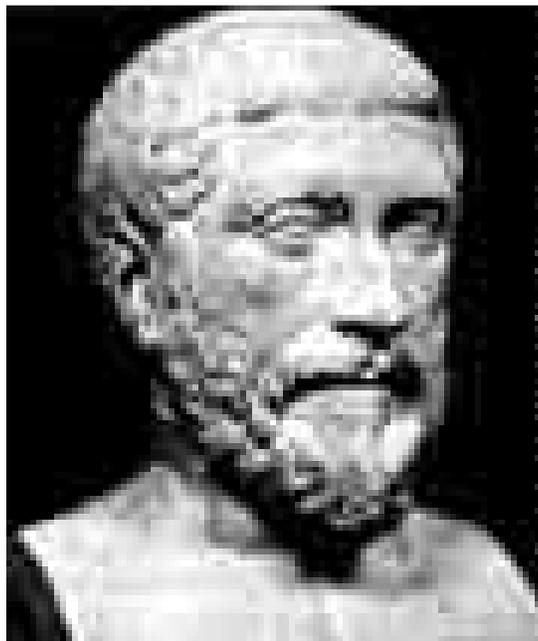


Pythagoras

Yr 8 Mathematics Assignment

Roydon Ng

6/4/2008



Due Date: Friday 2nd May

Mark: /

% at level

Part A (12 Marks)

Pythagoras and the Pythagoreans

1.	Who was Pythagoras and what did he do?	Pythagoras was a Greek philosopher. Pythagoras made significant contributions in the areas of mathematics, music, philosophy and astronomy.	/2
2.	When was Pythagoras born? When did he die?	Pythagoras was born in 569 BC. It is believed that Pythagoras died in 475 BC.	/2
3.	Where did Pythagoras live?	Pythagoras lived in Egypt for a period of time.	/1
4.	Who were the Pythagoreans?	Pythagoreans were people known for their clean lives. The Pythagoreans had interests in mathematics, music and philosophy.	/2
5.	What were some of the beliefs of the Pythagoreans?	The Pythagoreans believed that a person's words were usually careless. The Pythagoreans also believed that they had to help a man raise his burden.	/2
6.	What discoveries did Pythagoras and the Pythagoreans make in the area of mathematics?	Pythagoras is known to have discovered the Pythagoras' Theorem; there is a unique linking with all the sides of a right angled triangle. The Pythagoreans played an important part of the basic in Euclidean Geometry about the distance of two points.	/3

Part B (5 Marks)

Pythagoras' Theorem

1. Write down Pythagoras' Theorem (in words and as an equation)

- In words: For any right-angled triangle, the square on the hypotenuse equals the sum of the squares on the other two sides.

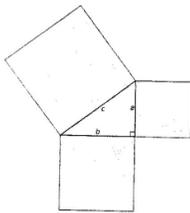
Equation: $a^2 + b^2 = c^2$

/2

Proving Pythagoras' Theorem

You have a friend who knows nothing about Pythagoras' Theorem.

Using the diagram on the left, explain to your friend how Pythagoras' theorem can be proved.



To prove Pythagoras' Theorem, we start with the four same triangles. The triangles merge to form a square with the side $(a + b)$ and a gap with sides of ' c '. We can work out the area of the big square in two ways.

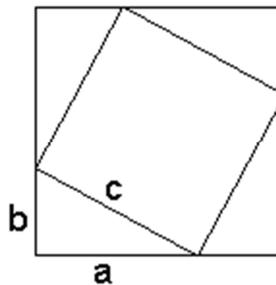
Therefore: $(a + b)^2 = 4 \cdot ab/2 + c^2$

Simplify: $(a + b)(a + b) = 2ab + c^2$

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

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

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



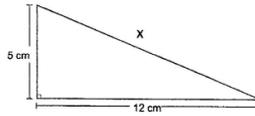
/3

Part C (7 Marks)

Using Pythagoras' Theorem

Use Pythagoras' theorem to answer the two questions below"

1. Find the value of 'x' in the triangle below.



Working:

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

$$= 25 + 144$$

$$= 169$$

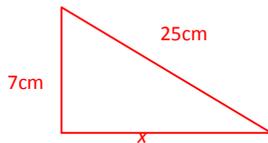
$$x = \sqrt{169}$$

$$= 13\text{cm}$$

/3

2. A triangle has one side 7 cm and a hypotenuse 25cm/ Find the length of the other side of the triangle (Draw a diagram first)

Working:



$$25^2 = 7^2 + x^2$$

$$625 = 49 + x^2$$

$$x^2 = 625 - 49$$

$$x^2 = 576$$

$$x = \sqrt{576}$$

$$x = 24\text{cm}$$

/4

Part D (3 Marks)

Pythagoras' Theorem in the Real World

What can Pythagoras' Theorem be used for in today's world? Collect pictures of objects in the real world where Pythagoras' theorem can be used.



Photo Frames,



Bridges,



Signs,

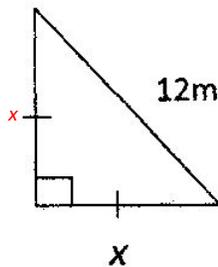


Buildings.

Part E (9 Marks)

Application of Pythagoras' Theorem

1. Find the length of x .



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

$$2x^2 = 12^2$$

$$2x^2 = 144$$

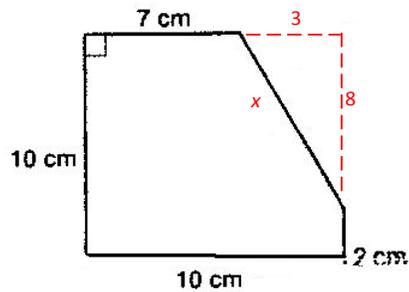
$$x^2 = 72$$

$$x = \sqrt{72}$$

$$x = 8.49\text{m}$$

/2

2. Find the perimeter of this shape



$$x^2 = 3^2 + 8^2$$

$$x^2 = 9 + 64$$

$$x^2 = 73$$

$$x = \sqrt{73}$$

$$x = 8.54$$

$$\text{Perimeter} = 10 + 10 + 7 + 2 + x$$

$$= 37.54$$

/3

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