## GEOMETRY (Q 4, PAPER 2)



2001				
4	(a)	Prov 24 u	Prove that the triangle with sides of lengths 10 units, 24 units and 26 units is right-angled. $10 \qquad 26 \qquad 10 \qquad 24$	
	(b)	Pro <sup>s</sup> side	we that a line which is parallel to one side-line of a triangle, and cuts a second , will cut the third side in the same proportion as the second.	
Soi	(c)	(i)	Draw a square with sides 7 cm and mark <i>o</i> , the point of intersection of the diagonals.	
	LUTIC	(ii)	Draw the image of the square under the enlargement with centre $o$ and scale factor $\frac{1}{2}$ .	
		(iii)	Calculate the area of the image square.	
		(iv) ON	Under another enlargement the area of the image of the square with sides 7 cm is 196 cm <sup>2</sup> . What is the scale factor of this englargement?	
4 (;	a)		<b>THEOREM 7</b> : (Converse of Pythagoras) If the square of the length of one side of a triangle is equal to the sum of the squares of the lengths of the other two sides then the triangle has a right angle and this is opposite the longest side.	
			If you can show that $z^2 = x^2 + y^2$ $\Rightarrow \Delta abc$ is a right-angled triangle and $ \angle abc  = 90^\circ$ is opposite the longest side, z. $a \qquad x \qquad b$	
$26^{2} = 676$ $10^{2} + 24^{2} = 100 + 576 = 676$ $\therefore 26^{2} = 10^{2} + 24^{2}$				
Th	erefo	ore, tl	he triangle is a right-angled triangle.	



## 4 (c) (i)

Construct a square *abcd* with side of length 7 cm. **STEP 1**. Using a ruler draw a side *ab* of length 7 cm.

**STEP 2**. Place the right-angle of a set square on point a and draw a light line. Do the same at point b.

**STEP 3**. Using the ruler draw a line, ad, of length 7 cm from point a through the light line. Do the same at point b drawing line bc.

**STEP 4**. Complete the square by joining c to d to form line cd. Using your set square, make sure all the angles are right-angled. Using your ruler, make sure each side is of length 7 cm.

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**NOTE:** All lengths shown are approximate. When you are doing the question the lengths must be the exact measure.

## 4 (c) (iii)

 $A = 3.5 \times 3.5 = 12.25 \text{ cm}^2$ 4 (c) (iv)  $k^2 = \frac{|\text{Image area}|}{|\text{Object area}|}$  ......2

 $|\text{Image area}| = 196 \text{ cm}^2$ 

|Object area| = 7 × 7 = 49 cm<sup>2</sup> Scale factor k = ? $k^2 = \frac{|\text{Image area}|}{|\text{Object area}|} \Rightarrow k^2 = \frac{196}{49} = 4$  $\therefore k = \sqrt{4} = 2$