Name ANSWERS	Class

MATHS TEACHER HUB

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Similarity and congruence

(9 – 1) Topic booklet

Foundation

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

9 The smallest angle of a triangle is 25°
The triangle is enlarged by scale factor 3

Ben says,

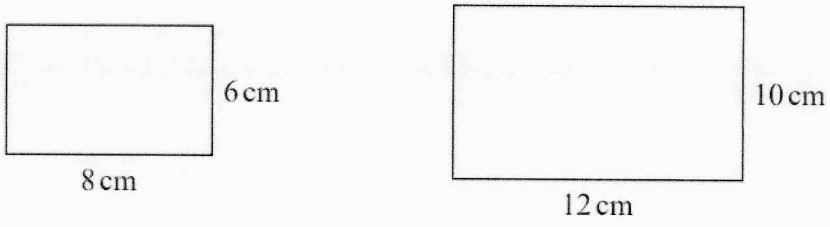
"The smallest angle of the enlarged triangle is 75° because $25 \times 3 = 75$"

Is Ben right?
Explain your answer.

Ben is wrong, angles stay the same when shapes are enlarged.

Specimen 2 – Paper 2F **(Total for Question 9 is 1 mark)**

16 Here are two rectangles.



Jim says,

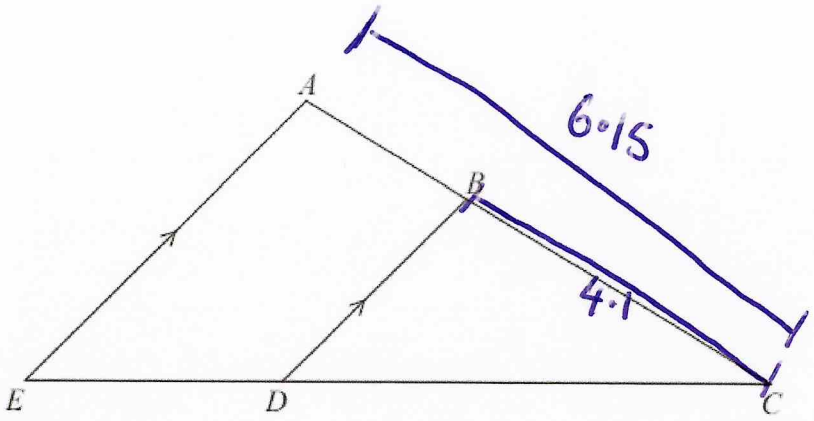
"The two rectangles are similar because $8 + 4 = 12$ and $6 + 4 = 10$"

Is Jim correct?
Explain your answer.

You have to multiply by a scale factor not add a similar value.

November 2018 – Paper 1F **(Total for Question 16 is 1 mark)**

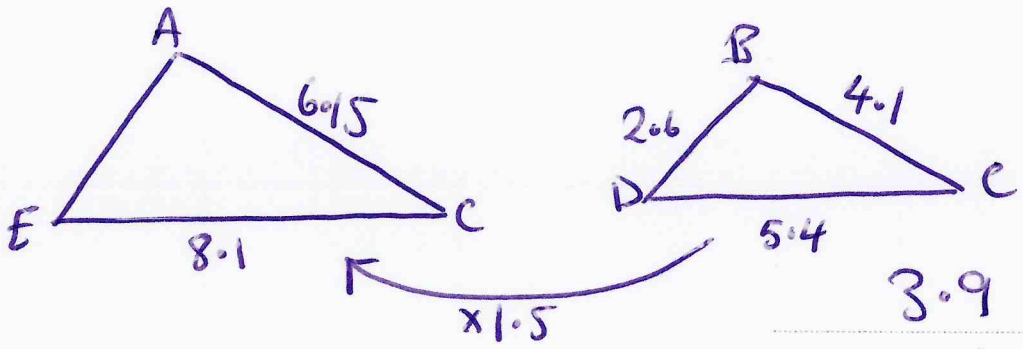
21



ABC and *EDC* are straight lines.
EA is parallel to *DB*.

EC = 8.1 cm.
DC = 5.4 cm.
DB = 2.6 cm.

(a) Work out the length of *AE*.



3.9 cm

(2)

AC = 6.15 cm.

(b) Work out the length of *AB*.

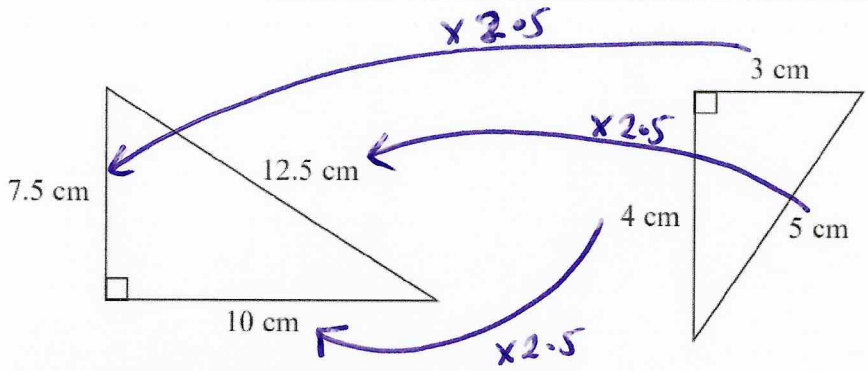
6.15 − 4.1 = 2.05

2.05 cm

(2)

(Total for Question 21 is 4 marks)

21

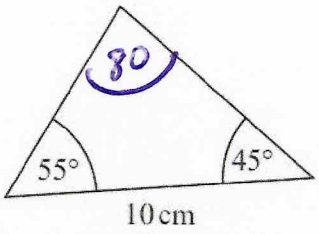


Show that these two triangles are mathematically similar.

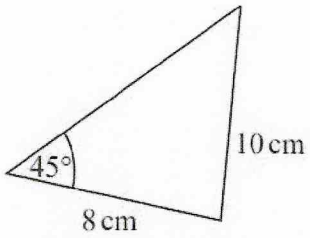
All corresponding sides are 2·5 times bigger.

(Total for Question 21 is 2 marks)

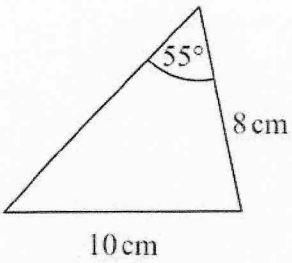
23 The diagram shows four triangles.



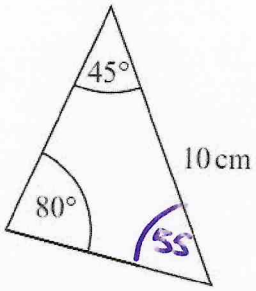
Triangle **A**



Triangle **B**



Triangle **C**



Triangle **D**

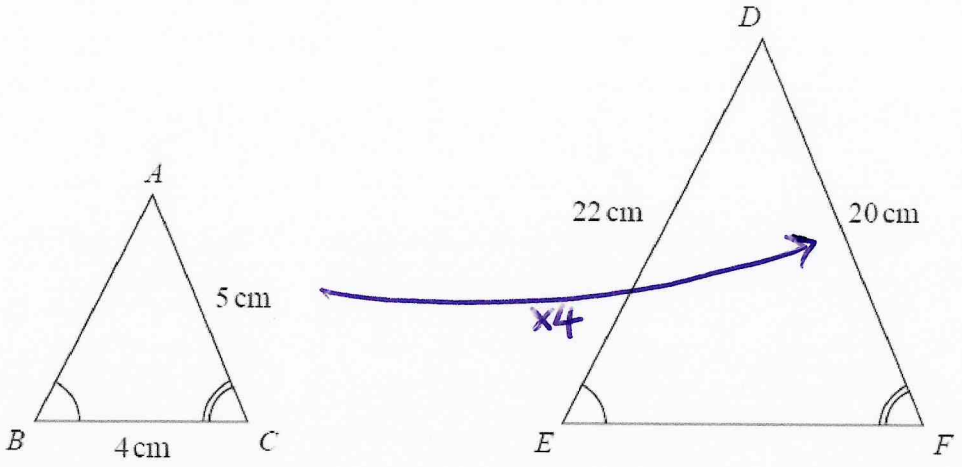
Two of these triangles are congruent.

Write down the letters of these two triangles.

A and D

(Total for Question 23 is 1 mark)

25 Triangle ABC and triangle DEF are similar.



(a) Work out the length of EF.

$4 \times 4 = 16$

16 cm

(2)

(b) Work out the length of AB.

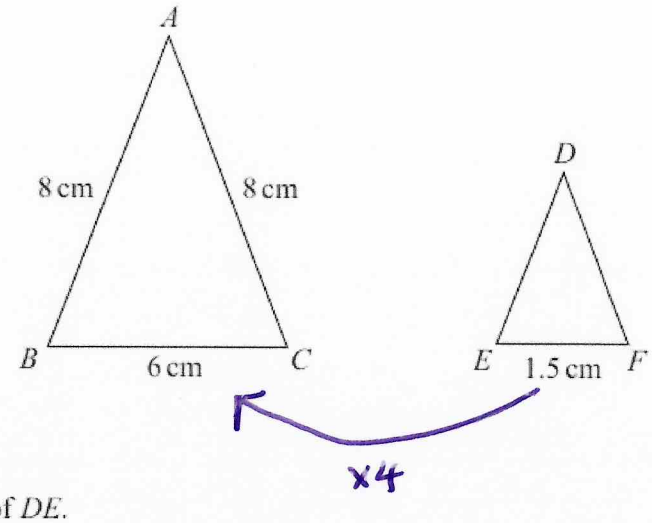
$22 \div 4 = 5.5$

5.5 cm

(2)

(Total for Question 25 is 4 marks)

27 *ABC* and *DEF* are two similar isosceles triangles.



$DE = DF$

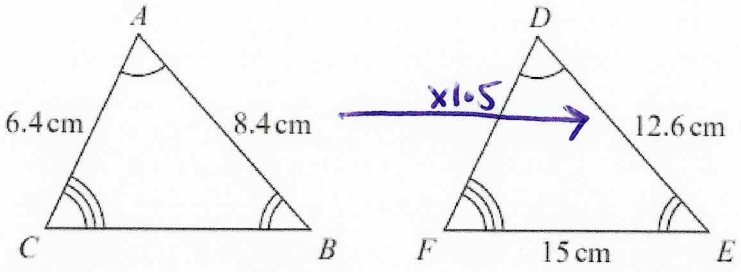
Work out the length of DE.

$8 \div 4 = 2$

2 ..... cm

(Total for Question 27 is 2 marks)

27 Triangle ABC and triangle DEF are similar.



(a) Work out the length of DF.

$\frac{12.6}{8.4} = 1.5$ $\quad 6.4 \times 1.5 = 9.6$

9.6 cm

(2)

(b) Work out the length of CB.

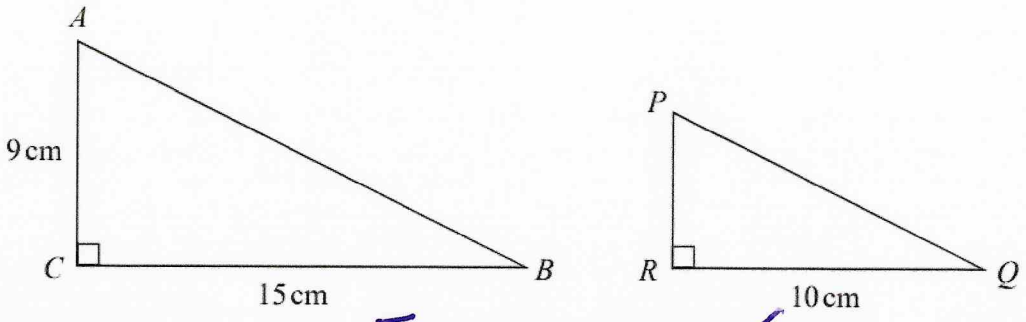
$15 \div 1.5 = 10$

10 cm

(2)

(Total for Question 27 is 4 marks)

29 *ABC* and *PQR* are similar right-angled triangles.



angle *ABC* = angle *PQR*

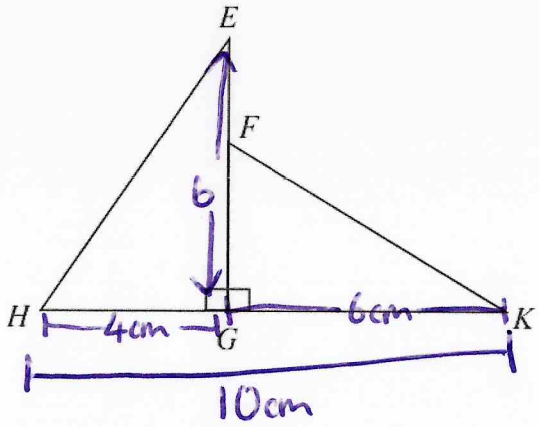
(a) Work out the length of *PR*.

$\frac{9}{1.5} = \frac{90}{15} = 6$

6 cm

(2)

Triangle *EGH* is congruent to triangle *KGF*.



HK = 10 cm.
HG = 4 cm.

(b) Work out the length of *EF*.

2 cm

(2)

(Total for Question 29 is 4 marks)