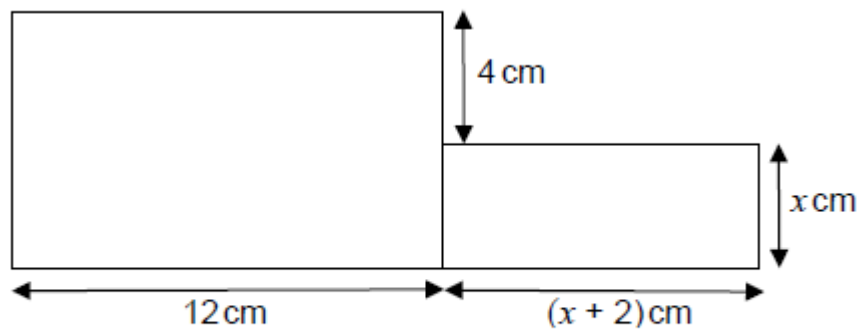


# Forming & Solving Equations (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	
Total Marks:	

1. The diagram below shows a composite shape formed by joining two rectangles.



*Diagram not drawn to scale*

The area of the larger rectangle is 4 times the area of the smaller rectangle.

Calculate the dimensions of the smaller rectangle.

You must justify any decisions that you make.

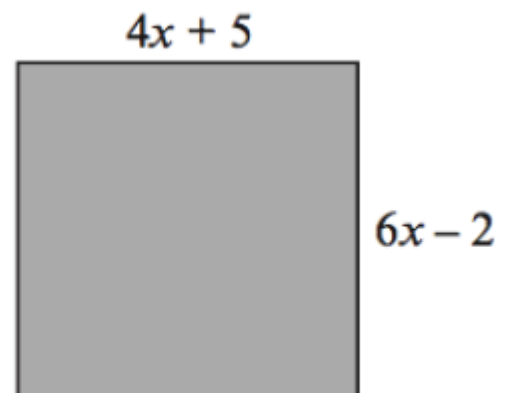
[7]

2. The diagram shows a square.

All the lengths are measured in centimetres.

Diagram not drawn to scale

Use an algebraic method to find the length of one side of the square.



*Diagram not drawn to scale*

[5]

3. (a) Solve  $\frac{3}{x} = 12$

[1]

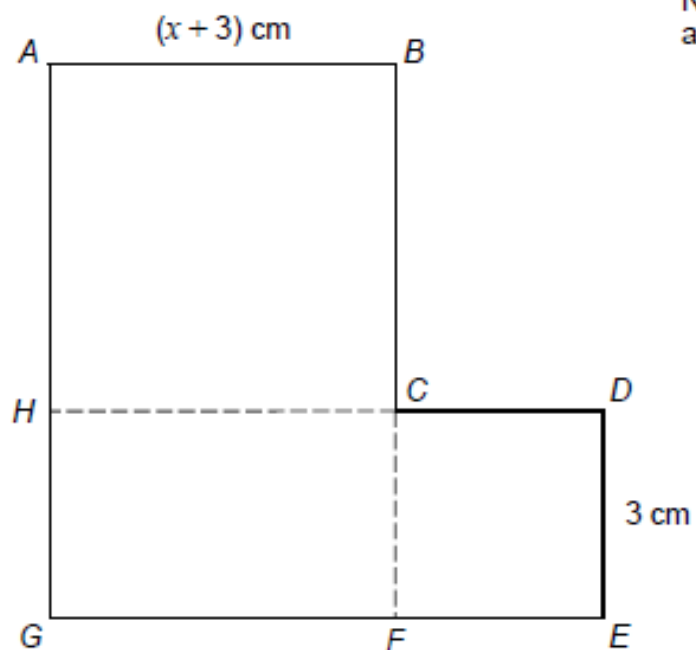
(b) Solve  $9x - 4 = 7(x + 2)$ .

[3]

4. ABCH is a square.

HCFG is a rectangle.

CDEF is a square.



Not drawn accurately

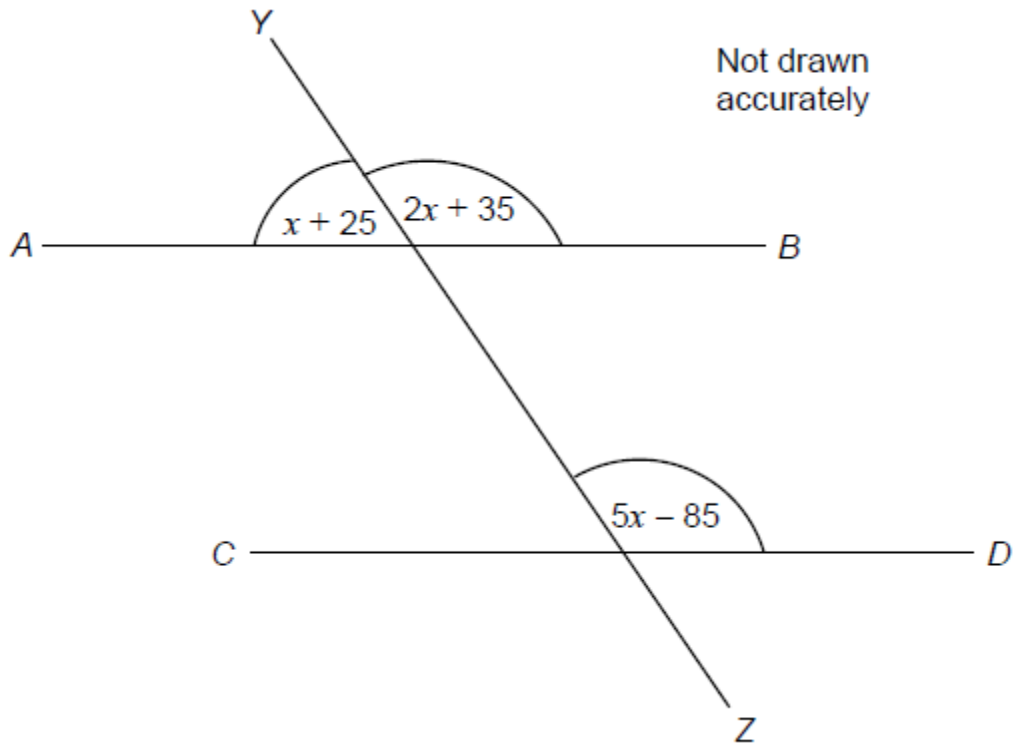
They are joined to make an L-shape.

Show that the total area of the L-shape, in  $\text{cm}^2$ , is  $x^2 + 9x + 27$

[4]

5. AB, CD and YZ are straight lines.

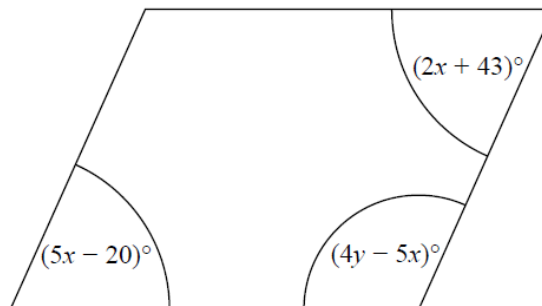
All angles are in degrees.



Show that AB is parallel to CD.

[4]

6. Here is a parallelogram.



Work out the value of  $x$  and the value of  $y$ .

$x =$  .....

$y =$  .....

[5]

7. Kieran, Jermaine and Chris play football.

- Kieran has scored 8 more goals than Chris.
- Jermaine has scored 5 more goals than Kieran.
- Altogether they have scored 72 goals.

How many goals did they each score?

Kieran .....

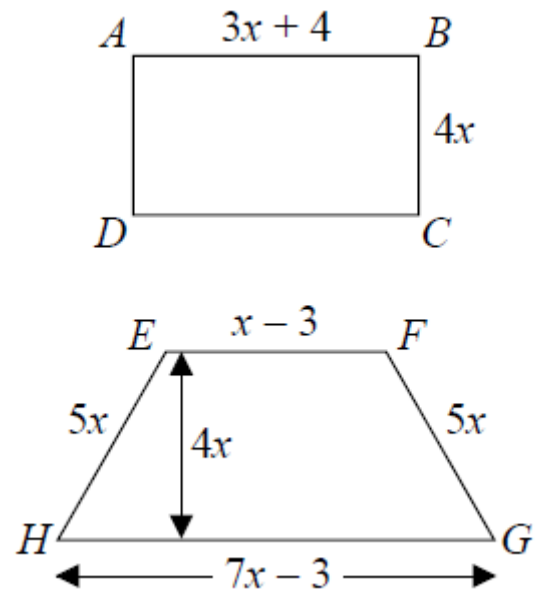
Jermaine .....

Chris .....

[5]

8. ABCD is a rectangle.

EFGH is a trapezium.



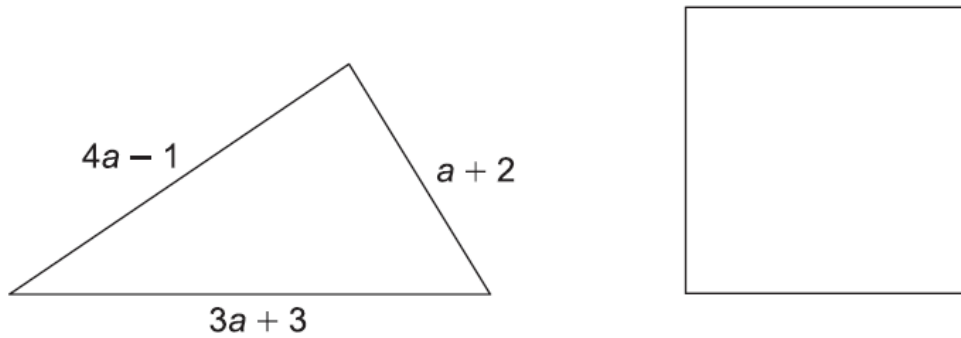
All measurements are in centimetres.

The perimeters of these two shapes are the same.

Work out the area of the rectangle.

..... .cm<sup>2</sup> [5]

9. The perimeter of the triangle is the same length as the perimeter of the square.



Find an expression for the length of one side of the square in terms of  $a$ .  
Give your answer in its simplest form.

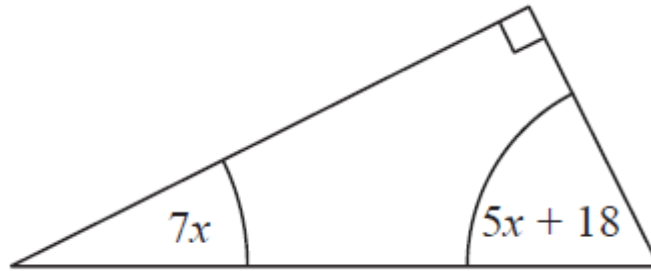
..... [4]

10. Alexander, Reiner and Wim each watch a different film.
- Alexander's film is thirty minutes longer than Wim's film.
  - Reiner's film is twice as long as Wim's film.
  - Altogether the films last 390 minutes.

How long is each of their films?

Alexander's film ..... minutes  
 Reiner's film ..... minutes  
 Wim's film ..... minutes [4]

11. The diagram shows a right-angled triangle.

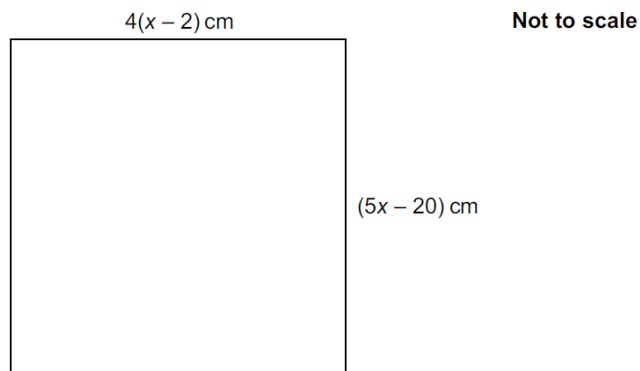


All the angles are in degrees.

Work out the size of the smallest angle of the triangle.

[3]

12. This is a square.

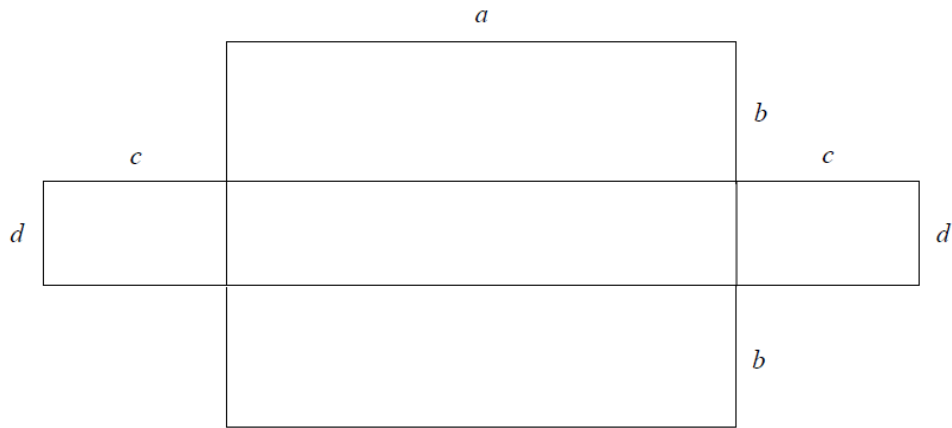


Work out the length of the side of the square.

..... cm [5]

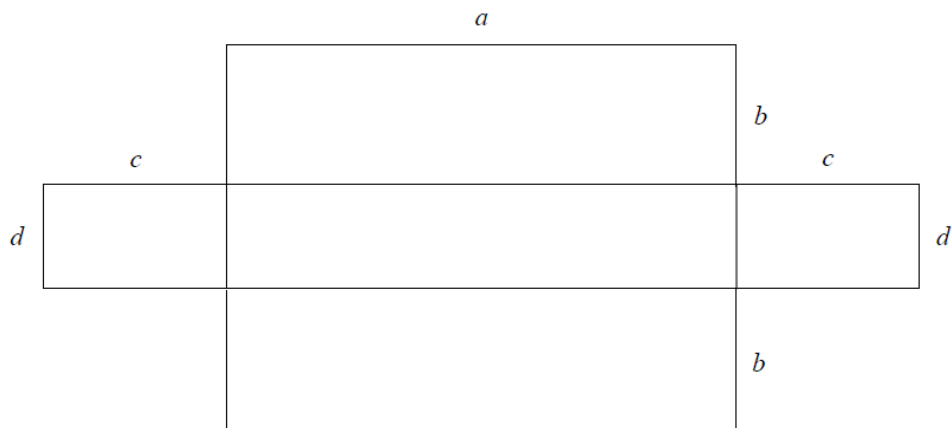
13. A shape is made from rectangles.

(a) On the diagram below shade an area represented by the expression  $ab$



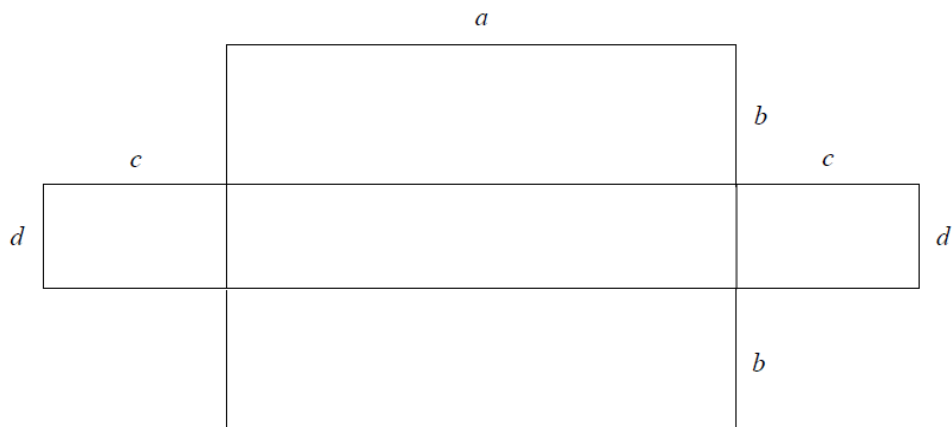
[1]

(b) On the diagram below shade an area represented by the expression  $ad + cd$



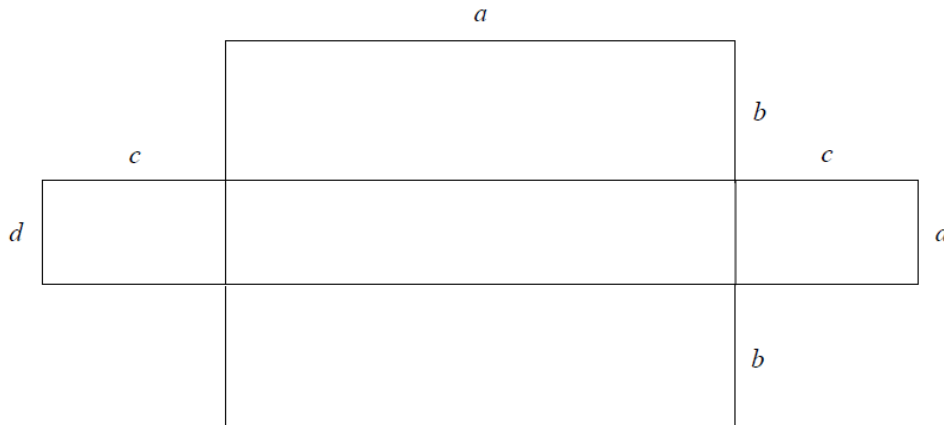
[1]

(c) On the diagram below shade the area represented by the expression  $d(a + 2c)$



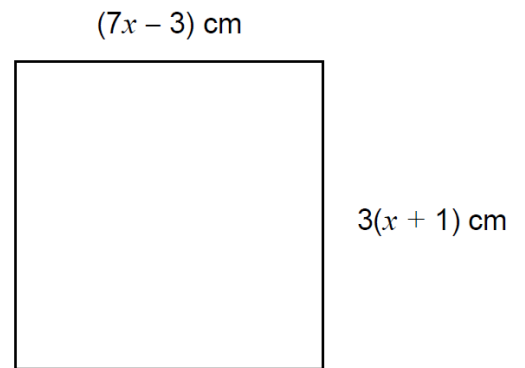
[1]

(d) Write down an expression for the area of the whole shape.



[1]

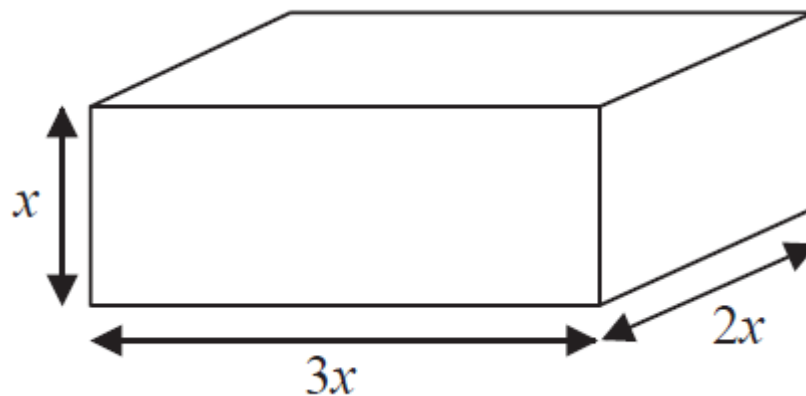
14 The diagram shows a square.



Work out the length of one side of the square.

[4]

15 Here is a cuboid.



All measurements are in centimetres.

$x$  is an integer.

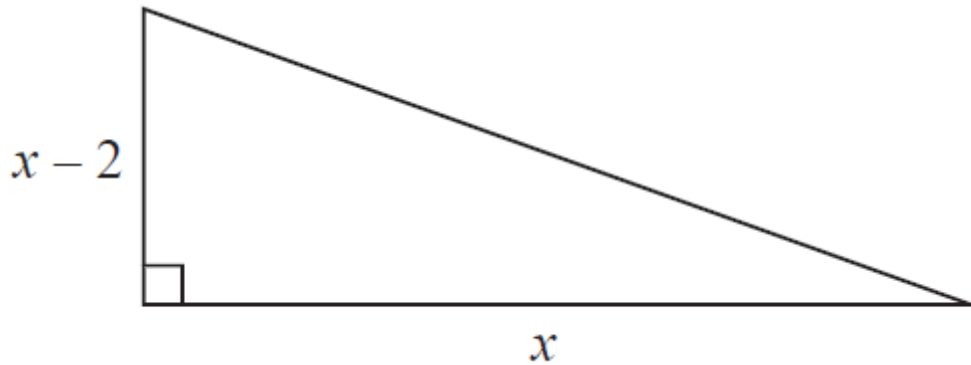


The total volume of the cuboid is less than  $900 \text{ cm}^3$

Show that  $x \leq 5$

[3]

16. Here is a right-angled triangle.



All measurements are in centimetres.

The area of the triangle is  $2.5 \text{ cm}^2$ .

Find the perimeter of the triangle.

Give your answer correct to 3 significant figures.

You must show all of your working.

..... cm [6]

17. A cuboid has length  $x \text{ cm}$ .

The width of the cuboid is  $4 \text{ cm}$  less than its length.

The height of the cuboid is half of its length.

a) The surface area of the cuboid is  $90 \text{ cm}^2$ .

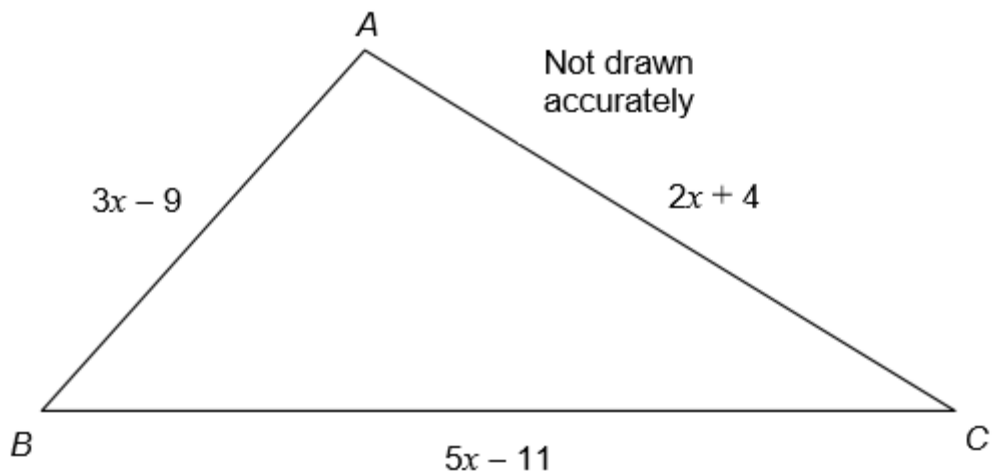
Show that  $2x^2 - 6x - 45 = 0$ .

[5]

b) Work out the volume of the cuboid.

(b) ..... cm<sup>3</sup> [6]

18. In this question all lengths are in centimetres.



Given  $AB : BC = 1 : 2$

show that  $AC : BC = 3 : 4$

[5]



## CREDITS AND NOTES

Question	Awarding Body	Question	Awarding Body
1	WJEC Eduqas	13	AQA
2	WJEC Eduqas	14	AQA
3	WJEC Eduqas	15	Pearson Edexcel
4	AQA	16	Pearson Edexcel
5	AQA	17	OCR
6	Pearson Edexcel	18	AQA
7	OCR	19	
8	Pearson Edexcel	20	
9	OCR	21	
10	OCR	22	
11	Pearson Edexcel	23	
12	OCR	24	

### Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.



### Links:

AQA <http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300>

OCR <http://ocr.org.uk/gcsemaths>

Pearson Edexcel <http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html>

WJEC Eduqas <http://www.eduqas.co.uk/qualifications/mathematics/gcse/>

### Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material