Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel

GCSE (9-1) in Mathematics 1MA1 Higher (Calculator) (Pearson release version)

Topic 4: Geometry (Test 2)

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Additional Assessment Materials, Summer 2021

General guidance to Additional Assessment Materials for use in 2021

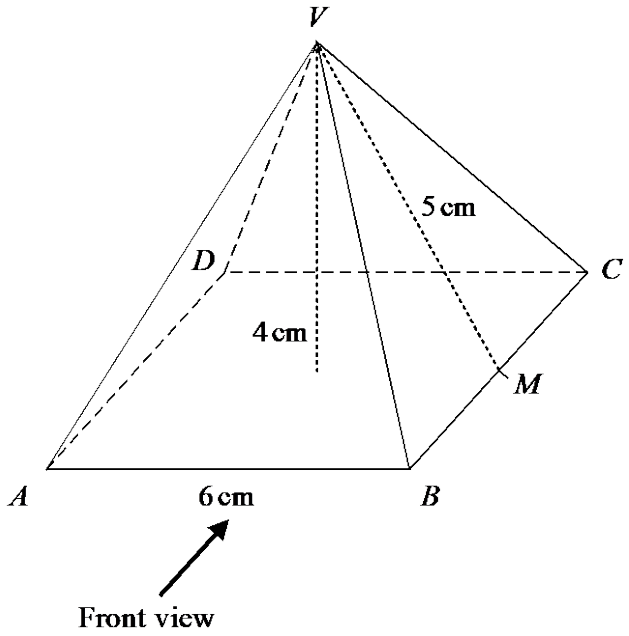
Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an optional part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

1 Here is a solid square-based pyramid, *VABCD*.



The base of the pyramid is a square of side 6 cm.
The height of the pyramid is 4 cm.
M is the midpoint of *BC* and *VM* = 5 cm.

(*a*) Draw an accurate front elevation of the pyramid from the direction of the arrow.

(2)

(*b*) Work out the total surface area of the pyramid.

.....

(4)

(Total for Question 1 is 6 marks)

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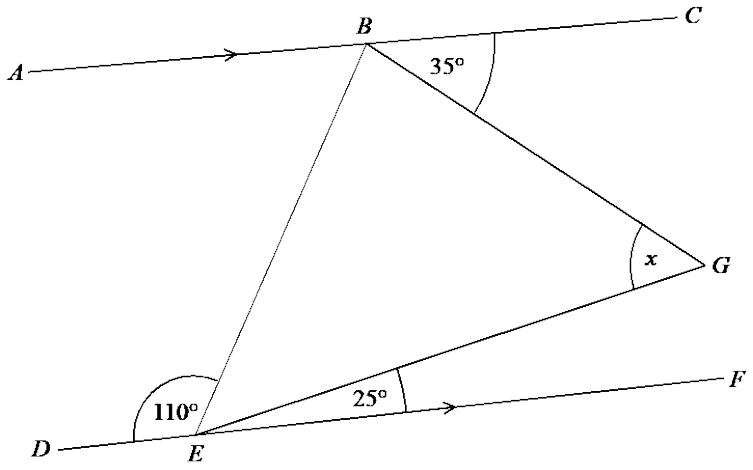
2 *BEG* is a triangle.



ABC and *DEF* are parallel lines.

Work out the size of angle *x*.
Give a reason for each stage of your working.

.....°

(Total for Question 2 is 4 marks)

3 $\mathbf{a} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$

Find $2\mathbf{a} - 3\mathbf{b}$ as a column vector.

$\begin{pmatrix} \\ \end{pmatrix}$

(Total for Question 3 is 2 marks)

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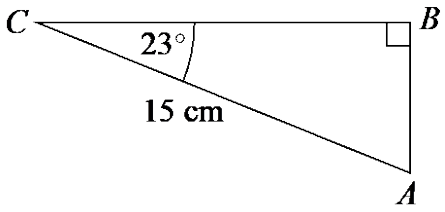
4 ABC is a right-angled triangle.



Calculate the length of AB.
Give your answer correct to 3 significant figures.

.....cm

(Total for Question 4 is 2 marks)

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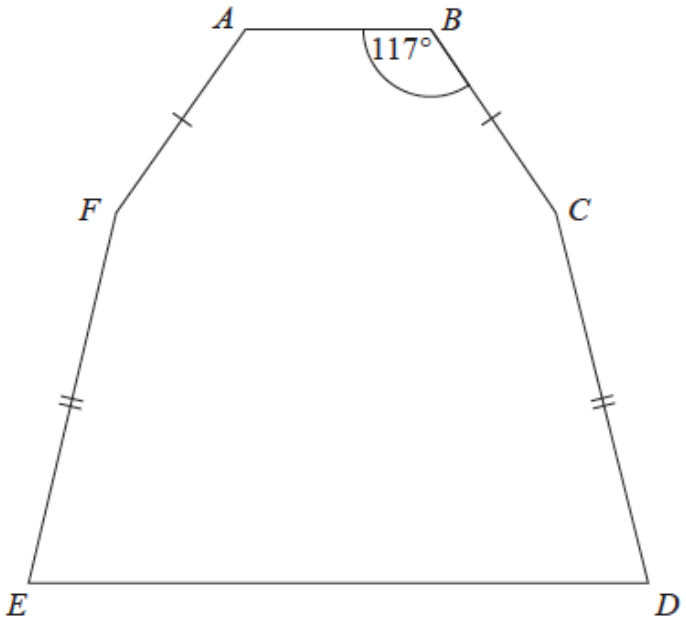
5 The diagram shows a hexagon.
The hexagon has one line of symmetry.



$FA = BC$
$EF = CD$
Angle $ABC = 117°$

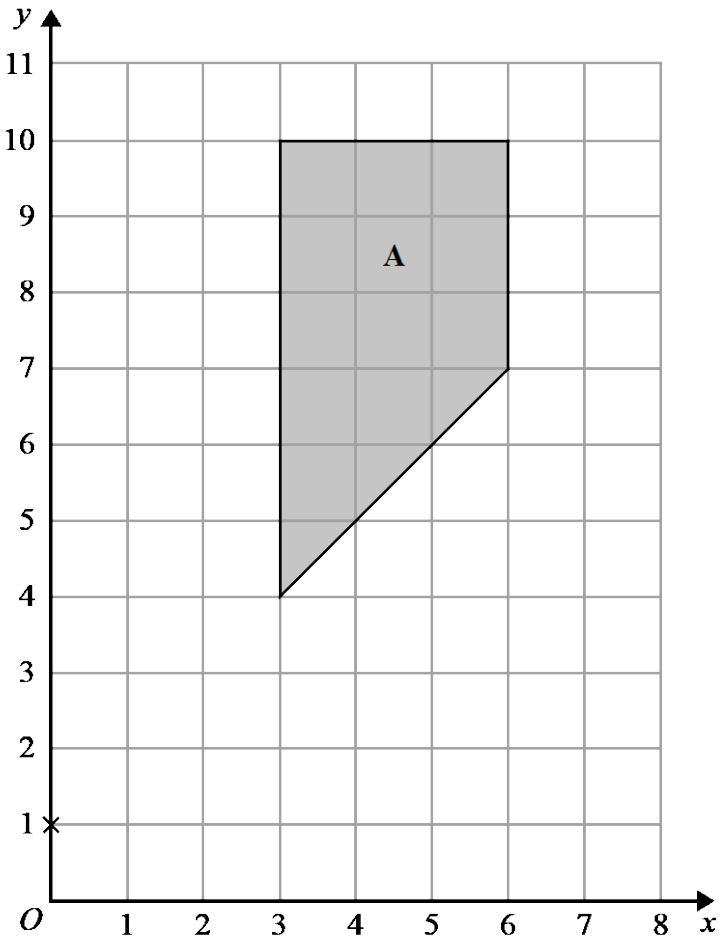
Angle $BCD = 2 \times$ angle CDE

Work out the size of angle AFE.
You must show all your working.

.....°

(Total for Question 5 is 4 marks)

6



Enlarge shape **A** by scale factor $\frac{1}{3}$ centre (0, 1)

(Total for Question 6 is 2 marks)

7 A square, with sides of length x cm, is inside a circle.
Each vertex of the square is on the circumference of the circle.

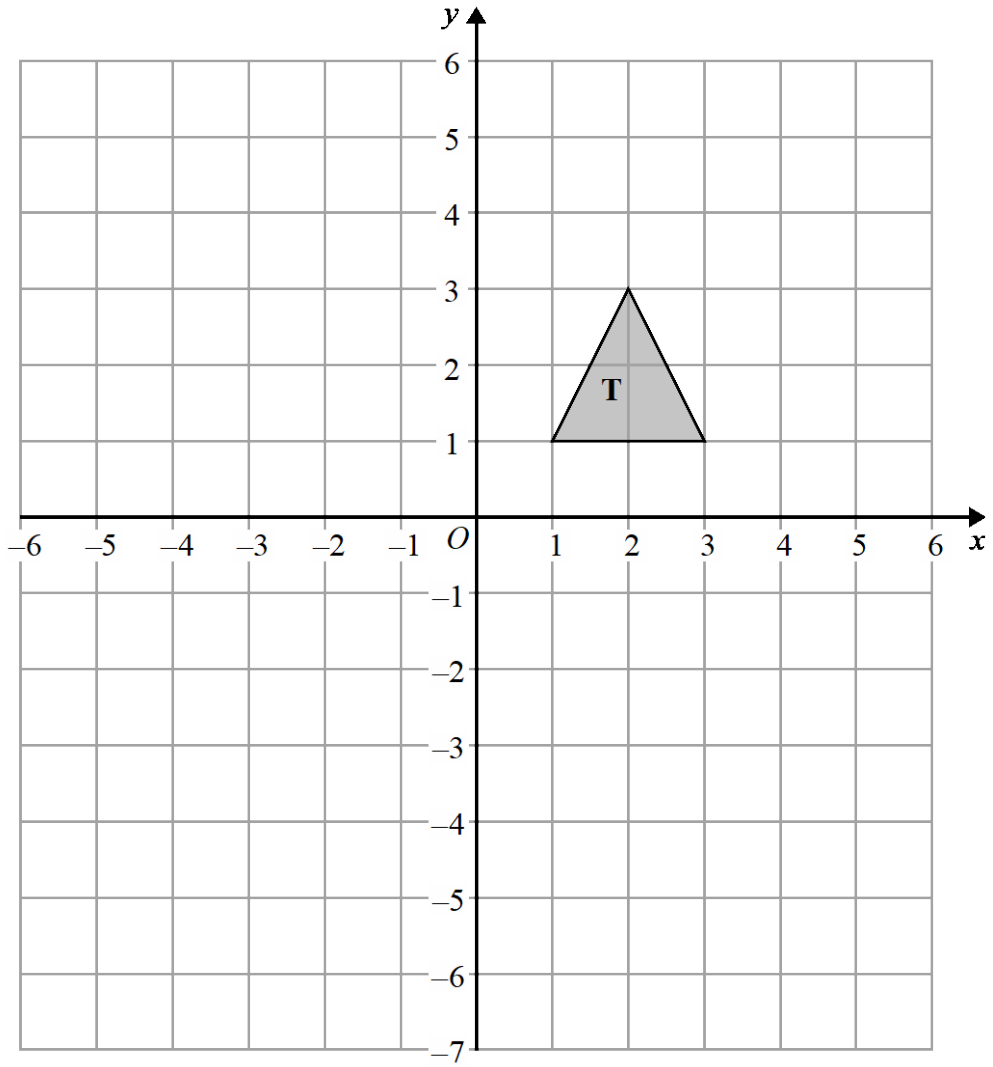
The area of the circle is 49 cm^2.

Work out the value of x.
Give your answer correct to 3 significant figures.

.....

(Total for Question 7 is 4 marks)

8



Shape **T** is reflected in the line $x = -1$ to give shape **R**.
Shape **R** is reflected in the line $y = -2$ to give shape **S**.

Describe the **single** transformation that will map shape **T** to shape **S**.

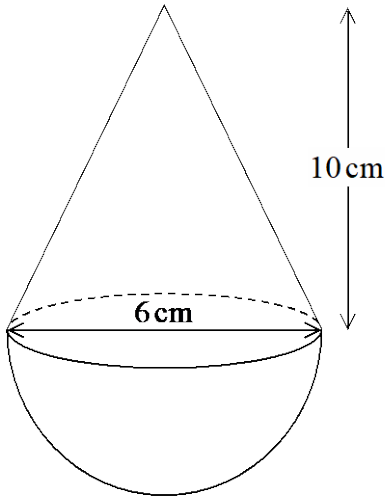
.....

.....

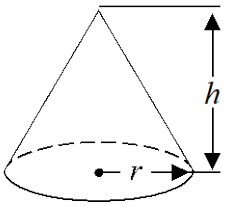
.....

(Total for Question 8 is 2 marks)

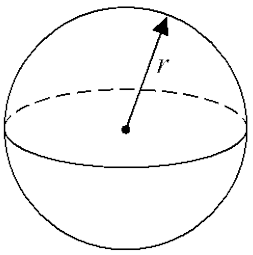
9 The diagram shows a solid shape.
The shape is a cone on top of a hemisphere.



Volume of a cone $= \frac{1}{3}\pi r^2 h$



Volume of a sphere $= \frac{4}{3}\pi r^3$



The height of the cone is 10 cm.
The base of the cone has a diameter of 6 cm.
The hemisphere has a diameter of 6 cm.

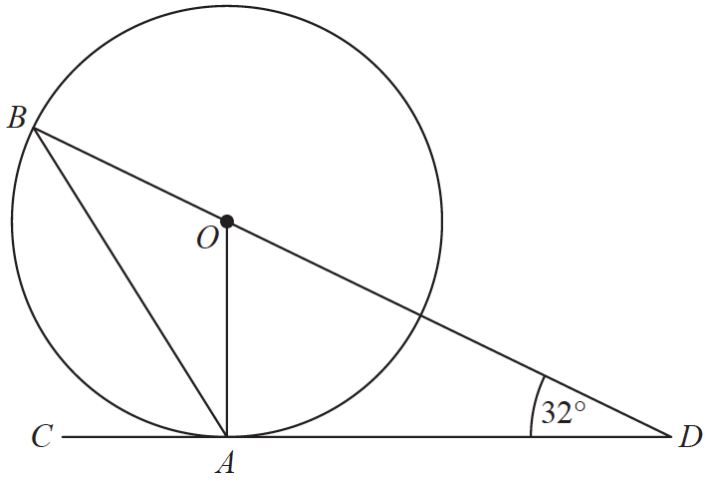
The total volume of the shape is $k\,\pi$ cm^3, where k is an integer.

Work out the value of k.

$k =$ .....

(Total for Question 9 is 4 marks)

10



A and *B* are points on a circle with centre *O*.
CAD is the tangent to the circle at *A*.
BOD is a straight line.

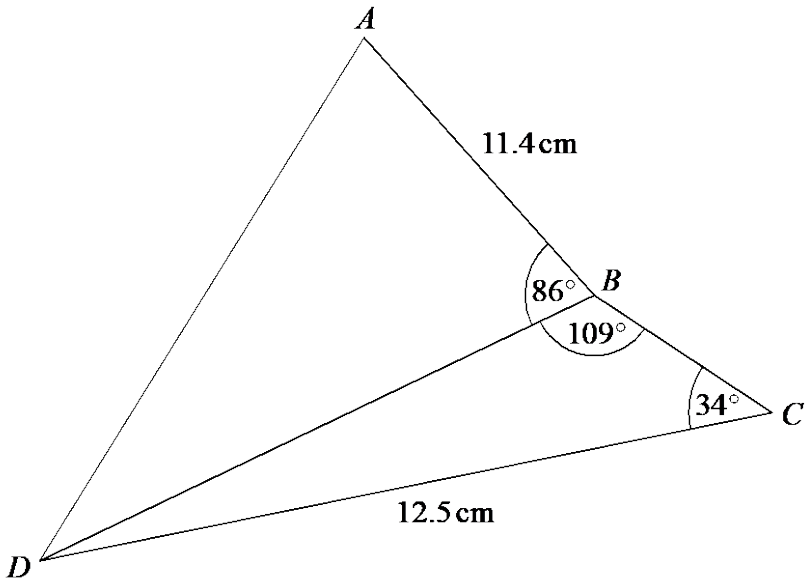
Angle *ODA* = 32°

Work out the size of angle *CAB*.
You must show all your working.

.....°

(Total for Question 10 is 3 marks)

11

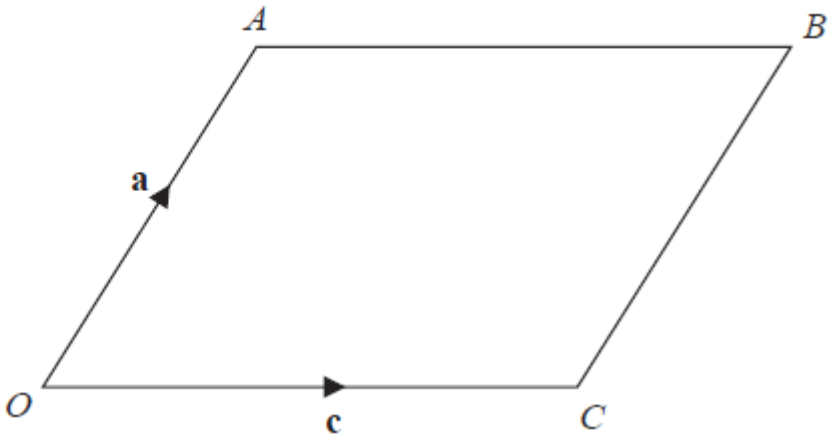


Work out the length of AD.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 11 is 5 marks)

12



$OABC$ is a parallelogram.

$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OC} = \mathbf{c}$

X is the midpoint of the line AC.
OCD is a straight line so that $OC : CD = k : 1$

Given that $\overrightarrow{XD} = 3\mathbf{c} - \frac{1}{2}\mathbf{a}$

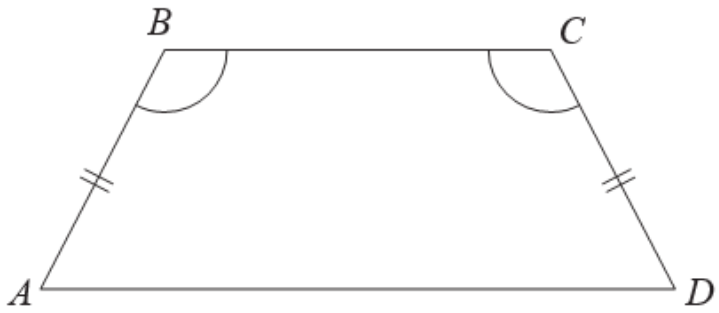
find the value of k.

K = ...

(Total for Question 12 is 4 marks)

13

ABCD is a quadrilateral.

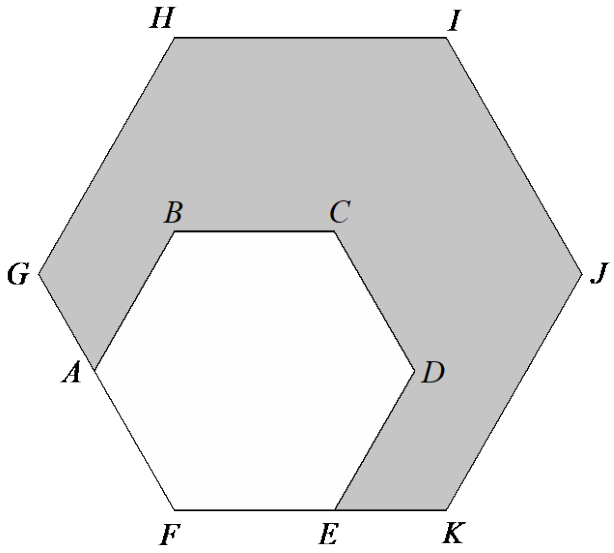


$AB = CD$.
Angle ABC = angle BCD.

Prove that $AC = BD$.

(Total for Question 13 is 4 marks)

14



ABCDEF is a regular hexagon with sides of length x.
This hexagon is enlarged, centre F, by scale factor p to give hexagon *FGHIJK*.

Show that the area of the shaded region in the diagram is given by $\frac{3\sqrt{3}}{2}(p^2-1)x^2$

(Total for Question 14 is 4 marks)

TOTAL FOR PAPER IS 50 MARKS