Candidate Name	Centre Number					Candidate Number				
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GCSE

MATHEMATICS
UNIT 2: CALCULATOR-ALLOWED
INTERMEDIATE TIER

2nd SPECIMEN PAPER SUMMER 2017

1 HOUR 45 MINUTES

ADDITIONAL MATERIALS
A calculator will be required for this paper.
A ruler, protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES
Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided in this booklet.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

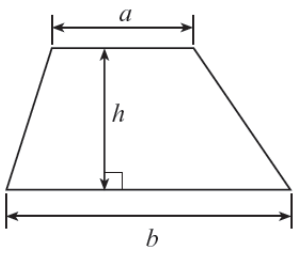
The number of marks is given in brackets at the end of each question or part-question.

The assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing in question **5**.

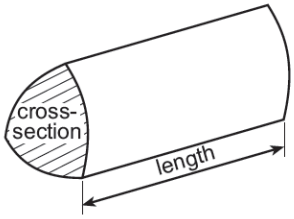
For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**4**	
2.	**6**	
3.	**3**	
4.	**4**	
5.	**6**	
6.	**4**	
7.	**6**	
8.	**3**	
9.	**6**	
10.	**5**	
11.	**2**	
12.	**4**	
13.	**6**	
14.	**3**	
15.	**6**	
16.	**7**	
17.	**5**	
TOTAL	**80**	

Formula list

Area of a trapezium = $\frac{1}{2}(a+b)h$



Volume of a prism = area of cross section $\times$ length



1. Using only the numbers in the following list,

26 27 28 29 30 31 32 33 34

write down

(a) a factor of 96,

[1]

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(b) a cube number,

[1]

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(c) a multiple of 8·5,

[1]

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(d) a prime number.

[1]

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2. *(a)* Simplify the expression $9g - 5f - 2g + 3f$.

[2]

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(b) Find the value of $3x + 4y$ when $x = -2$ and $y = 4$.

[2]

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(c) Write down the next two numbers in the following sequence.

20 14 9 5 2 ……. …….

[2]

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3. *(a)* Circle the correct answer for each of the following statements.

(i) Helen has bought one of the eighty tickets sold in a raffle. The probability that Helen wins the top prize in the raffle is

$\frac{1}{79}$ 1% 1:80 $\frac{1}{80}$ 80%

[1]

(ii) One ball is selected at random form a box containing 5 blue balls, 4 red balls and 1 yellow ball. The probability that the selected ball is blue is

$\frac{5}{5}$ $\frac{1}{2}$ $\frac{5}{41}$ $\frac{10}{5}$ 5%

[1]

(b) A bag contains some red, green and black beads.
One bead is selected at random from the bag.
The probability of selecting a green bead from the bag is $\frac{1}{3}$.

Which of the following sets of beads could have been in the bag?
Circle the correct answer.

2 red 1 green 1 black	3 red 6 green 3 black	3 red 3 green 4 black	7 red 4 green 1 black	5 red 3 green 4 black

[1]

4. *(a)* Calculate 38% of 15·6.

[2]

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(b) Express 52 as a percentage of 80.

[2]

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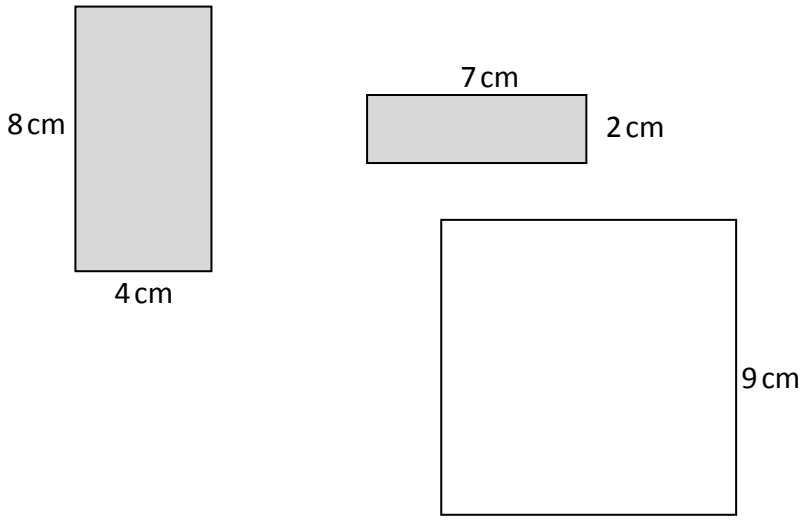
5. *You will be assessed on the quality of your organisation, communication and accuracy in writing in this question.*

The two shaded rectangles shown below are to be drawn on a white, square card of side length 9 cm.
The two rectangles should not overlap.



Diagrams not drawn to scale

Show clearly how this can be done, and calculate the area of the square card that will be unshaded.

[4 + OCW 2]

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6. The frequency table shows the number of points gained by a football team in each of its matches in the Welsh Premier League.

Points scored	Number of matches
0	6
1	5
3	11

Calculate the mean number of points gained per match by this team.
Give your answer correct to 2 decimal places.

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7. The diagram shows 2 identical parallelograms and the coordinates of four vertices. Find the coordinates of the vertices marked *A, B* and *C.*

[6]

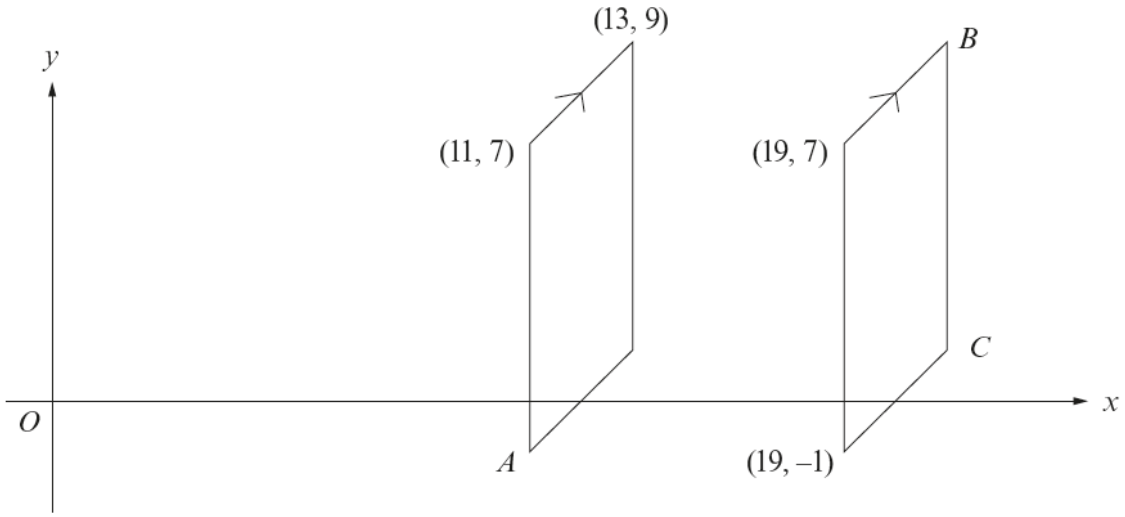

Diagram not drawn to scale

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A (…… , ……..) *B* (…… , ……..) *C* (…… , ……..)

8. Calculate the average speed of a car which travelled 80 miles in 2 hours and 30 minutes.

[3]

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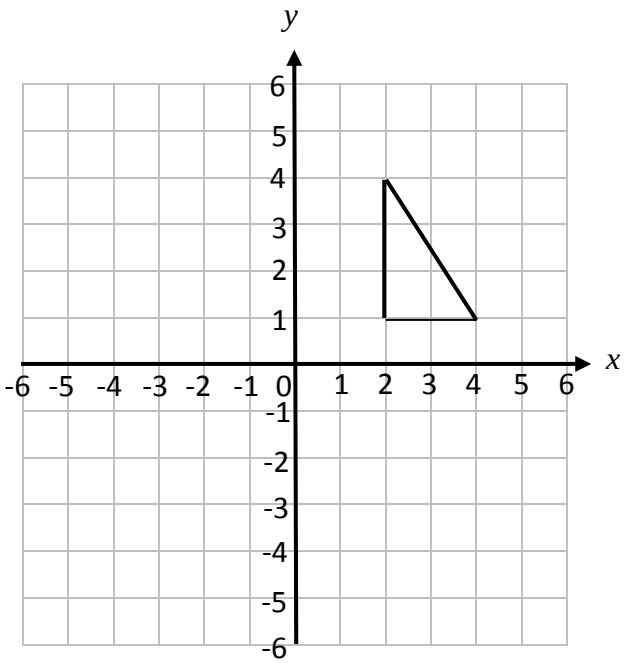
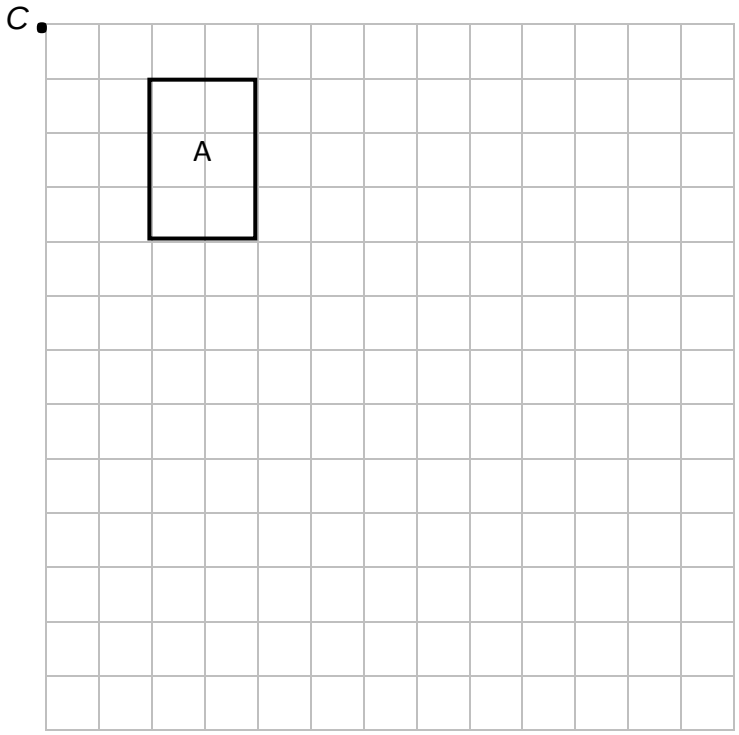
9. *(a)* Rotate the triangle 90 º anticlockwise about the origin.

[2]



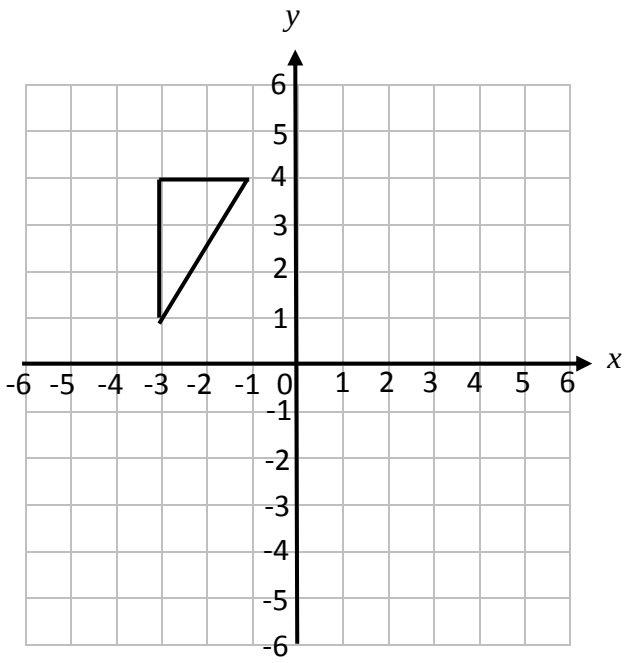
(b) Enlarge rectangle *A* using centre *C* and scale factor 2.

[2]



(c)(i) Translate the triangle using the column vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$.

[1]



(ii) Write down the column vector that will **reverse** the translation in part (i).

[1]

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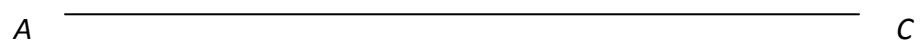
10. Use a ruler and a pair of compasses to construct triangle *ABC* where $AC = 10{\cdot}5$ cm, $A\hat{C}B = 60°$ and $C\hat{A}B = 45°$.
Line *AC* has been drawn for you.

[5]



11. Circle either TRUE or FALSE for each statement given below.

[2]

STATEMENT		
Circles with diameters of equal length are congruent.	TRUE	FALSE
Regular pentagons whose perimeters are of equal length are congruent.	TRUE	FALSE
Scalene triangles that have the same three angles are congruent.	TRUE	FALSE
Rectangles with equal areas are congruent.	TRUE	FALSE

12. A solution to the equation

$$x^3 - 6x - 4 = 0$$

lies between 2 and 3.

Use the method of trial and improvement to find this solution correct to 1 decimal place.
You must show all your working.

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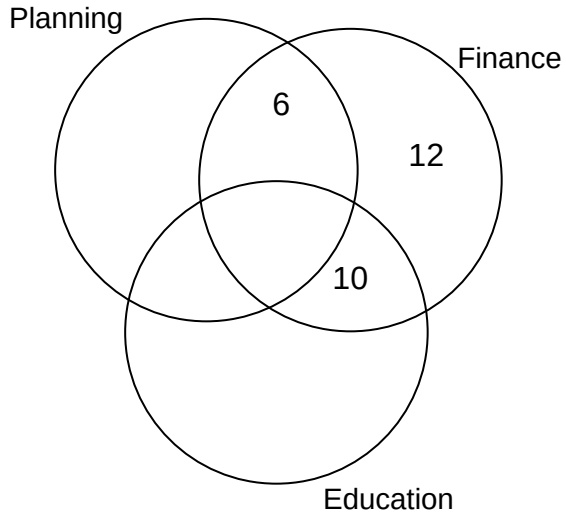
13. A total of 45 councillors make up the Planning, Finance and Education committees of a local council.
Some of the councillors sit on two of these committees.
No councillor sits on all three committees.

2 councillors sit on both the Planning Committee and the Education Committee.
There are 18 councillors on the Education Committee.

(a) Complete the Venn diagram.

[3]



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(b) How many councillors sit on both the Planning and Finance committees?

[1]

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(c) One of these 45 councillors is chosen at random.
What is the probability that this councillor is on the Planning Committee?

[2]

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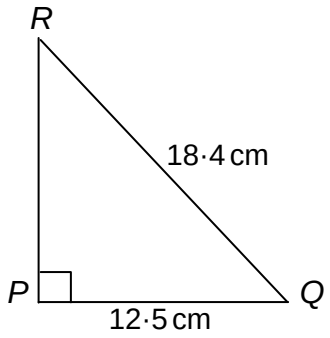

Diagram not drawn to scale

Calculate the length of *PR*, giving your answer correct to 1 decimal place.

[3]

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15. A bus company advertises two prices for a return journey between Aberystwyth and Cardiff: an adult price and the price for a child.

A family of 2 adults and 3 children paid a total of £71.50 for their tickets.
A group consisting of 3 adults and 4 children paid a total of £101 for their tickets.

Use an algebraic method to calculate the total amount paid by a group of 4 adults and 2 children.

[6]

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16. *(a)* Factorise $x^2 - 4x - 21$, and hence solve $x^2 - 4x - 21 = 0$.

[3]

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(b) Solve the equation $\frac{x-7}{4} + \frac{2x+5}{8} = \frac{1}{2}$.

[4]

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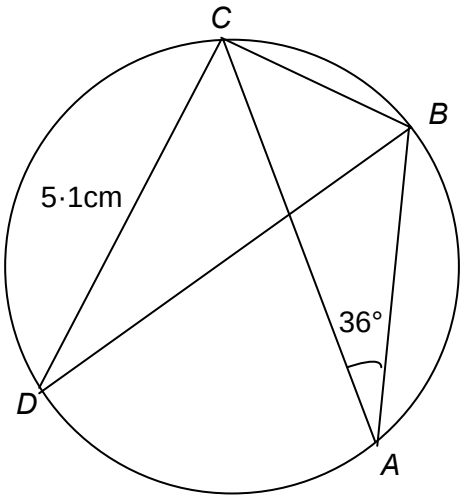

Diagram not drawn to scale

Points *A*, *B*, *C* and *D* lie on the circumference of a circle. *BD* is the diameter of the circle, *CD* = 5·1 cm and $B\hat{A}C$ = 36º.

Calculate the length of the chord *BC*.
You must give reasons as part of your solution.

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END OF PAPER