Candidate Name	Centre Number					Candidate Number				
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GCSE

MATHEMATICS
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

2nd SPECIMEN PAPER SUMMER 2017

1 HOUR 45 MINUTES

ADDITIONAL MATERIALS
The use of a calculator is not permitted in this examination.
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.

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.

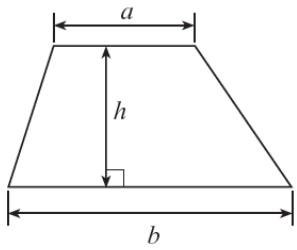
For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**5**	
2.	**3**	
3.	**4**	
4.	**4**	
5.	**4**	
6.	**5**	
7.	**7**	
8.	**7**	
9.	**6**	
10.	**7**	
11.	**3**	
12.	**6**	
13.	**3**	
14.	**4**	
15.	**6**	
16.	**6**	
TOTAL	**80**	

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

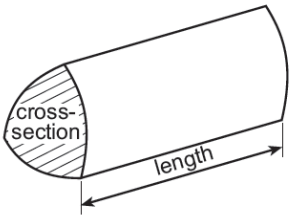
The assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing in question **8**.

Formula list

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



Volume of a prism = area of cross section × length



1. *(a)* Find the size of angle x. [2]

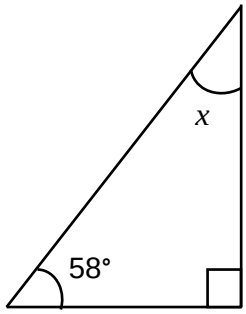


Diagram not drawn to scale

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x = ...°

(b) ABC is an isosceles triangle with $AB = AC$ and $B\hat{A}C = 34°$.
BCD is a straight line.
Find the size of $A\hat{C}D$.

[3]

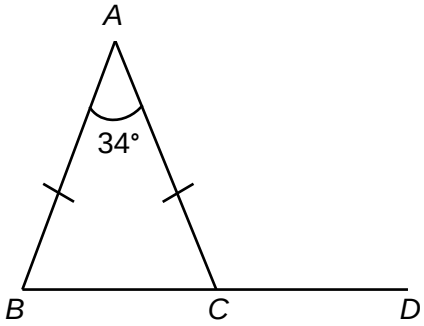

Diagram not drawn to scale

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$A\hat{C}D$ = ...°

2. Circle the correct answer for each of the following statements.

(a) 0·2 is equivalent to

2% 20% 0·2% $\frac{1}{5}$% $\frac{2}{10}$%

[1]

(b) 5·4 – 2·16 is equal to

2·24 3·24 3·34 3·36 7·56

[1]

(c) $\frac{5}{6} - \frac{1}{3}$ is equal to

$\frac{51}{63}$ $\frac{4}{3}$ $\frac{1}{2}$ $\frac{4}{6}$ 0·43

[1]

3. Sian states,

'When a fair coin is tossed and a fair dice is thrown,
the probability of getting a head and an even number is $\frac{1}{2}$.'

Is Sian correct?
You must show enough working to justify your answer.

[4]

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4. *(a)* A rectangle, *R*, has sides of 5 m and 3 m.

Draw a sketch of a different rectangle that has the same perimeter as rectangle *R*.
Write down the length of each of the four sides of your rectangle.

[2]

(b) Both the length and width of rectangle *R* are exactly doubled.
Does this mean that the area is also doubled?
You must show enough working to justify your answer.

[2]

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5. Calculate 20 % of $\frac{1}{4}$ of 120.

[4]

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6. Solve each of the following equations.

(a) $\frac{x}{4} = 8$ [1]

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(b) $\frac{7}{x} = 14$

[1]

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(c) $9x + 4 = 2x + 39$ [3]

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7. *(a)* The median value of three numbers is 6.
The three numbers are x, 6 and y, in ascending order.
Both the range and the mean of these three numbers are also 6.

Find the value of x and the value of y. [2]

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x = …… y =……

(b) (i) Find the mode of the following set of numbers, and show that the range, median and mean of the numbers are all the same as the mode.

7 11 6 4 7 [3]

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Range ……

Mode ……

Median ……..

Mean ……

(ii) Each of the five numbers is increased by 1.
Circle either TRUE or FALSE for each of the following statements.

[2]

The range is increased by 1.	TRUE	FALSE
The mode is increased by 1.	TRUE	FALSE
The median is increased by 1.	TRUE	FALSE
The mean is increased by 1.	TRUE	FALSE

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

A right-angled triangle *ADE* is attached to a trapezium *ABCD* as shown below.

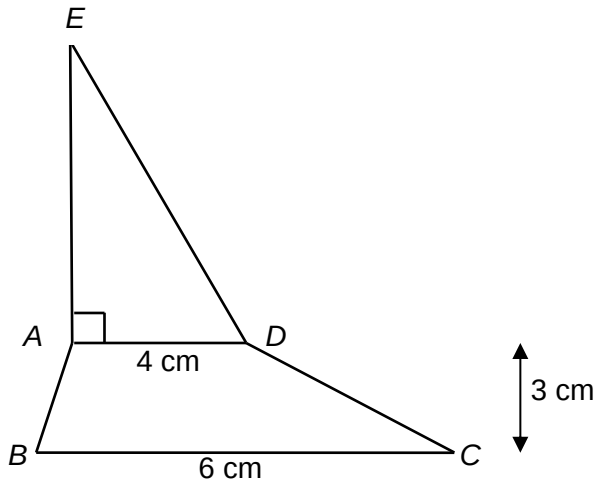

Diagram not drawn to scale

AD = 4 cm, *BC* = 6 cm, and the perpendicular height of the trapezium is 3 cm.
The triangle and the trapezium have equal area.

Calculate the length of *AE*.

[5 + OCW 2]

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9. At lunchtime on any given day, Alun has one of the following drinks:
coffee, tea, mineral water or fruit juice.
His choice of drink each day is independent of his choice of drink on any other day.
The table below shows the probabilities for three of his choices of drink on any randomly chosen day.

Drink	Coffee	Tea	Mineral Water	Fruit Juice
Probability	0·5	0·18	0·27	

(a) Calculate the probability that, on any randomly chosen day, Alun has a fruit juice at lunchtime.

[2]

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(b) What is the probability that, on any randomly chosen day, he has either tea or mineral water at lunchtime?

[2]

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(c) What is the probability that, in any randomly chosen week, Alun has coffee on the Tuesday and has tea on the Friday?

[2]

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10. *(a)* The table below shows some of the values of $y = 3x^2 - 4x - 10$ for values of x from -2 to 3.

Complete the table by finding the value of y for $x = 2$.

[1]

x	-2	-1	0	1	2	3
$y = 3x^2 - 4x - 10$	10	-3	-10	-11		5

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(b) On the graph paper opposite, draw the graph of $y = 3x^2 - 4x - 10$ for values of x from -2 to 3.

[2]

(c) Using your graph, write down the values of x when $y = 0$.
Give your answers correct to 1 decimal place.

[1]

Values are ..... and .....

(d) Give the coordinates of the point on your curve at which the y-values stop decreasing and begin to increase.
Write each coordinate correct to 1 decimal place.

[2]

x = ……. y = ……..

(e) If you needed to draw the graph of $y = 3x^2 - 4x - 10$ for values of x from -3 to 4 using the same size of graph paper, what would you need to alter on the graph?

[1]

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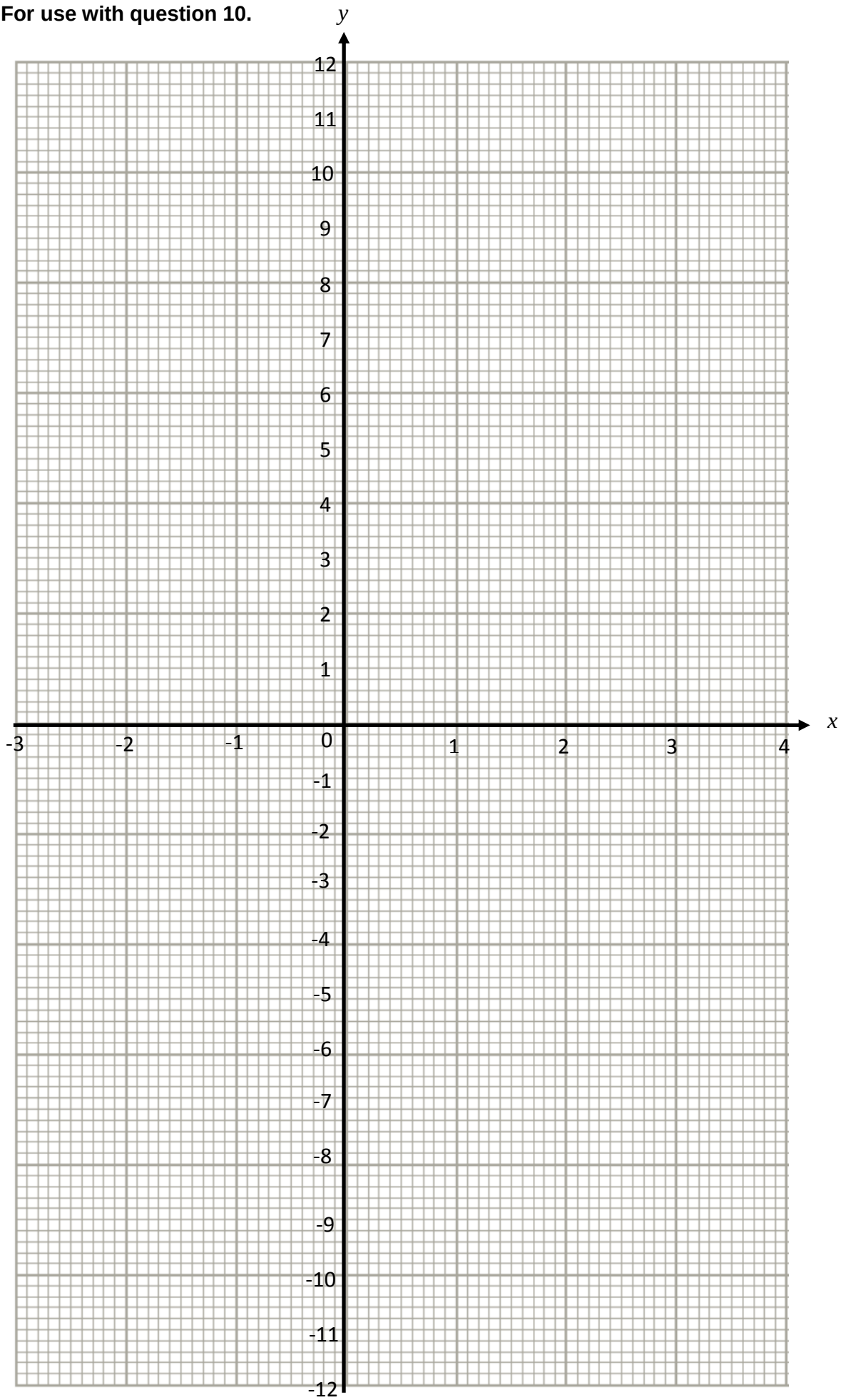
For use with question 10.



11. Are the following statements true or false? Circle the correct answer.
You must give a **full explanation** of your decision in each case.

(a)

$a^2 + b^2$ is always an even number when a and b are whole numbers.

[1]

true / false

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(b)

$a^2 b^2$ is always an odd number when a and b are odd numbers.

[2]

true / false

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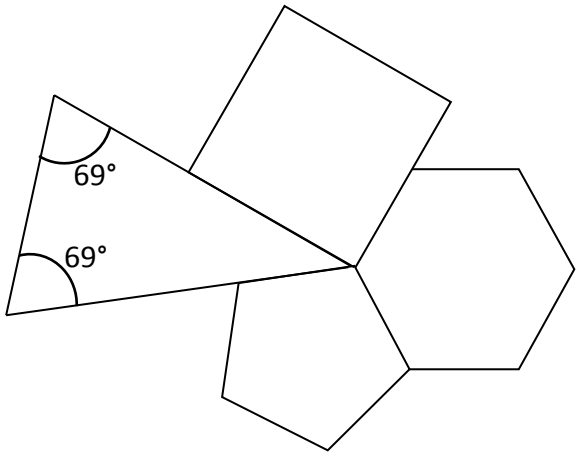
12. Prove that it is possible for a square, a regular pentagon, a regular hexagon and an isosceles triangle with two equal angles of 69° to meet at a point as shown below.

[6]



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13. Circle the correct answer for each of the following statements.

(a) The gradient of the line $2y = 4x + 3$ is

$\frac{1}{2}$ $\frac{3}{2}$ $\frac{2}{3}$ $\frac{3}{4}$ 2

[1]

(b) The line $3y = 5x - 6$ crosses the y-axis *at*

$y = -2$ $y = -\frac{1}{2}$ $y = 2$ $y = \frac{5}{3}$ $y = \frac{1}{2}$

[1]

(c) The line $y = 3x - 2$ has a point with coordinates

(3 , –2) (0 , 2) (-3 , 2) (2 , 3) (3 , 7)

[1]

14. Find, in standard form, the value of

(a) $\frac{2 \cdot 7 \times 10^{10}}{6000}$,

[2]

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(b) $(4{\cdot}5 \times 10^{-2}) \times (3 \times 10^{-3})$.

[2]

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15. For a particular visitor to Gwynedd, taking a trip up Snowdon is independent of visiting Caernarfon Castle.
The probability that the visitor takes a trip up Snowdon **and** visits Caernarfon Castle is 0·12.

(a) Complete the following tree diagram.

[4]

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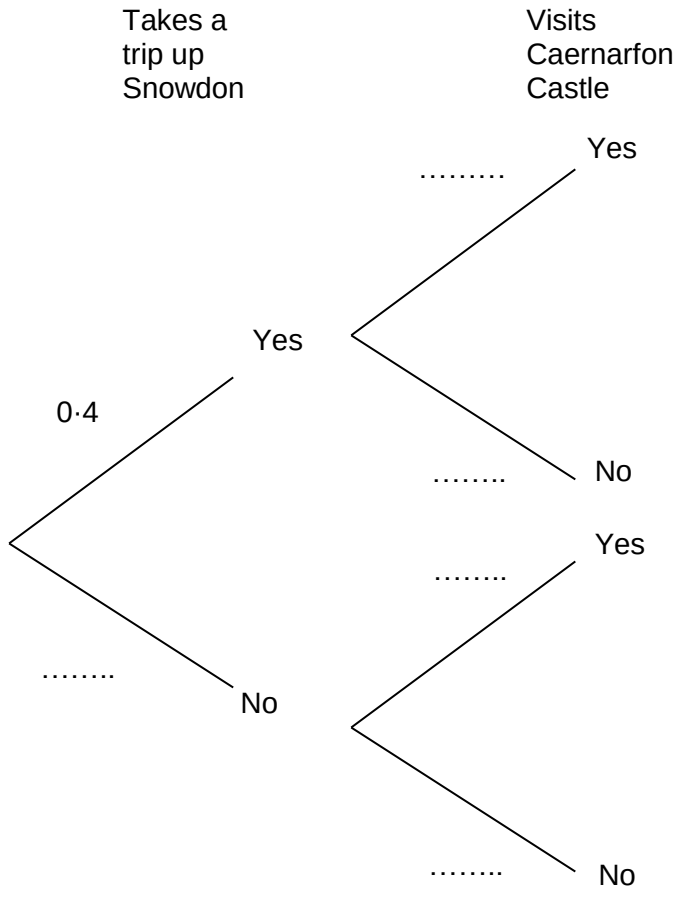

(b) Calculate the probability that the visitor does not go up Snowdon and does not visit Caernarfon Castle.

[2]

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16. *(a)* Solve the equation $\frac{8-x}{3} = 5-x$.

[3]

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(b) Factorise $6a^2 - 8ab$.

[2]

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(c) Simplify $\frac{(3x-4)^6}{(3x-4)^3}$.

[1]

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END OF PAPER