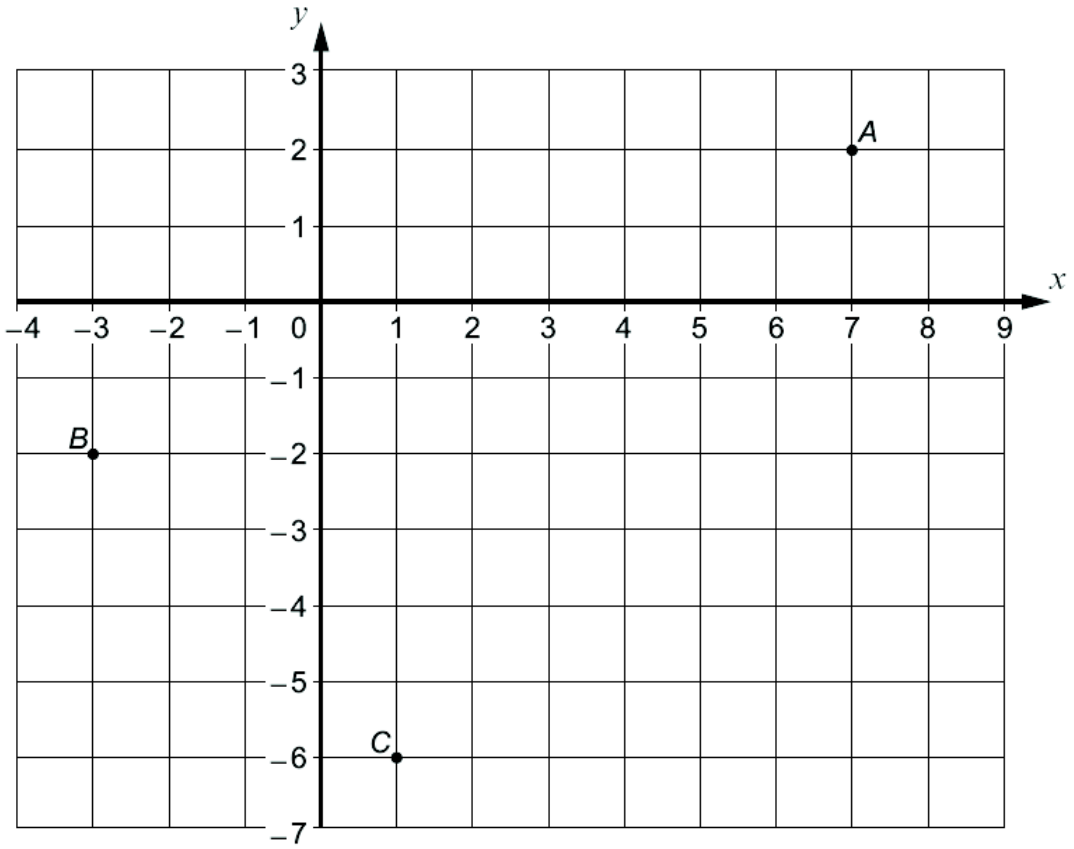
5. *(a)* Write down the coordinates of the points *A*, *B* and *C* shown on the grid below. [3]



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

(b) Write down the coordinates of the mid-point of line *AC*. [1]

Mid-point at (....., ...)

6. *(a)* Use the following clues to find the missing number.

- The number is between 1 and 20
- It is not an even number
- It is a multiple of 3
- It is a square number

[3]

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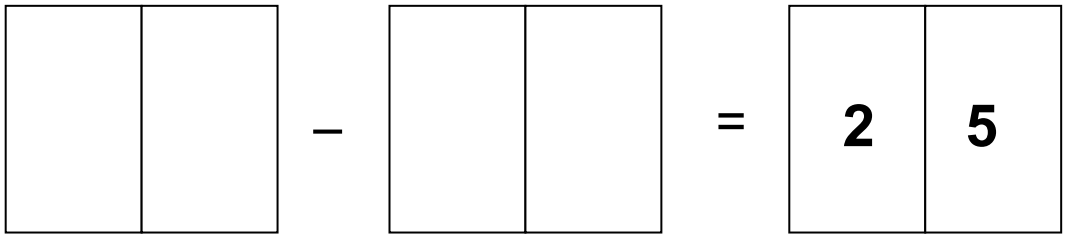
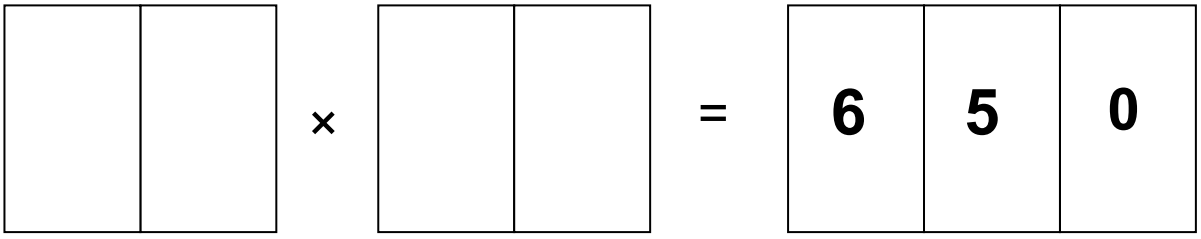
Missing number is .....

(b) (i) Using all the numbers 0, 1, 3 and 5, fill in the blanks. [1]



(ii) Using all the numbers 0, 1, 3 and 5, fill in the blanks. [1]



7. Calculate the floor area of a rectangular room that is 8 metres long and 3 metres wide.
You must give the units of your answer. [3]

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8. In the following table, the letters a, b and c represent different numbers.
The total for each row is given at the side of the table.
Find the values of a, b and c. [3]

a	$2a$	a	12
a	b	b	13
a	b	c	6

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a = ... b = ... c = ...

9. Calculate the following.

(a) $5^2 \times 2^3$ [2]

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(b) $0{\cdot}3 \times 0{\cdot}6$ [1]

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(c) $8{\cdot}7 - 5{\cdot}25$ [1]

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(d) $\frac{7}{8} - \frac{1}{4}$ [2]

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10. *(a)* Write down the next two numbers in the following sequence. [2]

18 17 14 9 ....

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(b) Simplify the expression $7x + 3y - 5x - 6y$. [2]

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

(a) The area of the right-angled triangle drawn below is

240 cm^2 60 cm^2 260 cm^2 120 cm^2 6240 cm^2

[1]

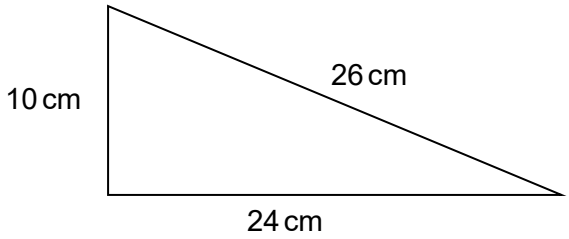

Diagram not drawn to scale

(b) The value of x shown in the triangle below is

40° 20° 9° 180° $\frac{1}{9}$°

[1]

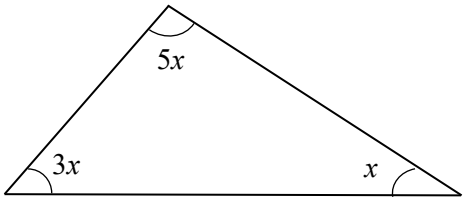

Diagram not drawn to scale

(c) The volume of the cuboid shown below is

30 m^3 10 m^3 31 m^3 62 m^3 235 m^3

[1]

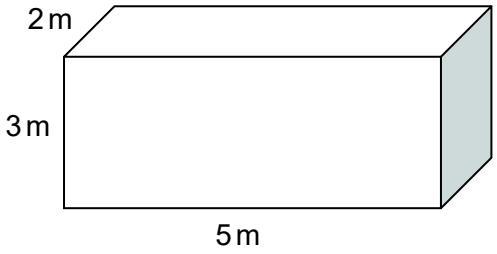

Diagram not drawn to scale

12. In a game, cards are chosen at random from two boxes.
One card is chosen at random from box A and one card is chosen at random from box B.

Box A contains these two cards. | **−3** | **+3** |

Box B contains these five cards. | **−2** | **−1** | **0** | **+1** | **+2** |

The two numbers on the chosen cards are multiplied together to give a score.
The person choosing the cards wins a prize if the score is more than zero.

Complete the table below to show all the possible scores and calculate an estimate for the number of prize winners when 70 people play the game once. [6]

		Box B				
		−2	−1	0	+1	+2
Box A	−3				**−3**	**−6**
	+3				**+3**	**+6**

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13. Solve each of the following equations.

(a) $7x - 4 = 2x + 11$ [3]

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(b) $3(2x + 7) = 9$ [3]

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

(a)
When a number that ends in 8 is divided by 2, the answer is always a multiple of 4. [1]

true / false

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(b)
When two consecutive whole numbers are multiplied together, the answer is always an even number. [2]

true / false

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15.

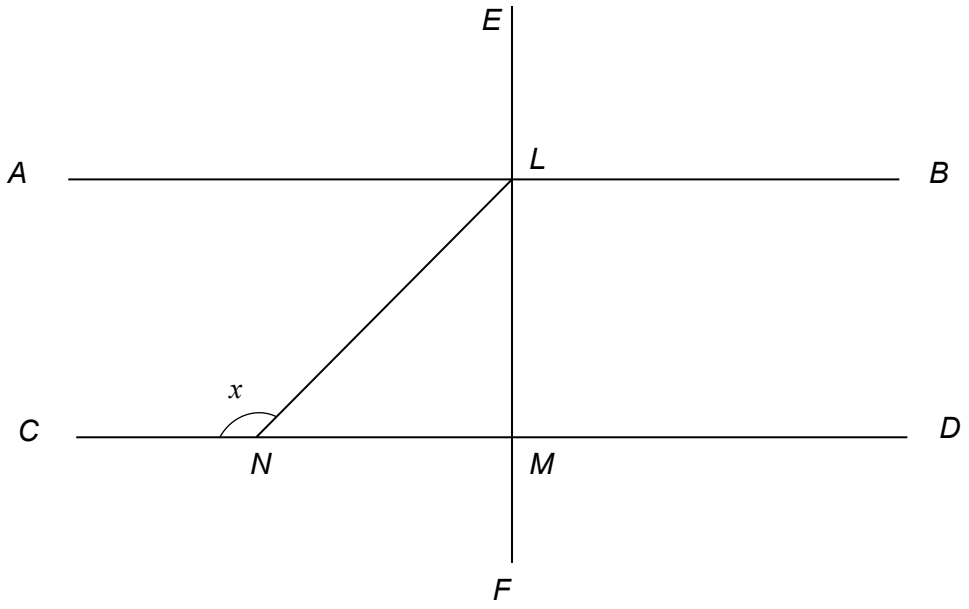

Diagram not drawn to scale

The line *AB* is parallel to the line *CD*.
The line *CD* is perpendicular to the line *EF*.
Triangle *LMN* is an isosceles triangle.
Find the size of angle x.
You must show all your working. [3]

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16. Select four **different** whole numbers between 1 and 9 inclusive such that,

- their mean is 6
- their range is 5. [2]

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Answer: ……. ……. ……. …….

Candidate Name	Centre Number					Candidate Number				
						0				

GCSE

MATHEMATICS
UNIT 2: CALCULATOR-ALLOWED
HIGHER TIER

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.

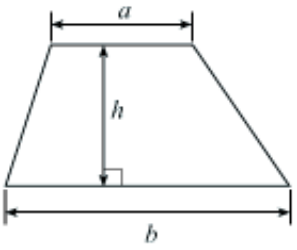
The number of marks is given in brackets at the end of each question or part-question.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**5**	
2.	**5**	
3.	**3**	
4.	**4**	
5.	**4**	
6.	**6**	
7.	**3**	
8.	**3**	
9.	**8**	
10.	**5**	
11.	**4**	
12.	**3**	
13.	**7**	
14.	**4**	
15.	**3**	
16.	**2**	
17.	**6**	
18.	**5**	
TOTAL	**80**	

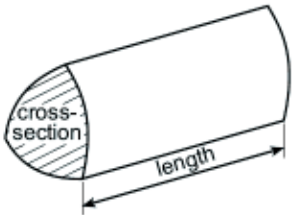
The assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing in question **9***(b)*.

Formula list – Higher tier

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



Volume of a prism = area of cross section × length

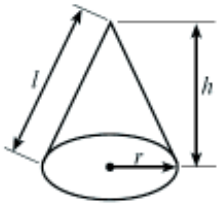


Volume of a sphere $= \frac{4}{3}\pi r^3$

Surface area of a sphere $= 4\pi r^2$

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

Curved surface area of a cone $= \pi r l$

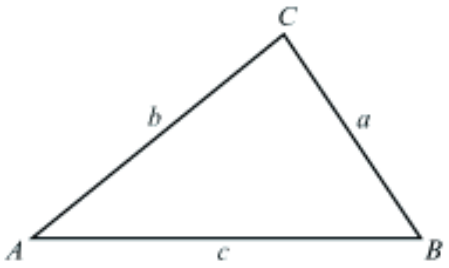


In any triangle ABC,

Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Annual Equivalent Rate (AER)

AER, as a decimal, is calculated using the formula $\left(1 + \frac{i}{n}\right)^n - 1$, where i is the nominal interest rate per annum as a decimal and n is the number of compounding periods per annum.

1. Four of the interior angles of a seven-sided polygon are 114°, 150°, 160° and 170°.
The other three interior angles of this polygon are equal.
Calculate the size of each of the other three interior angles. [5]

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2. *(a)* Express 144 as the product of its prime factors in index form. [3]

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(b) Given that $60 = 2^2 \times 3 \times 5$, find

(i) the highest common factor (HCF) of 144 and 60, [1]

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(ii) the lowest common multiple (LCM) of 144 and 60. [1]

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3. *(a)* Solve the inequality given below. [2]

$$7n < 5n + 11$$

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(b) Give the largest integer value for n that satisfies this inequality. [1]

n = ……...

4. A solution to the equation

$$x^3 - 7x - 75 = 0$$

lies between 4 and 5.

Use the method of trial and improvement to find this solution correct to 1 decimal place.
You must show all your working. [4]

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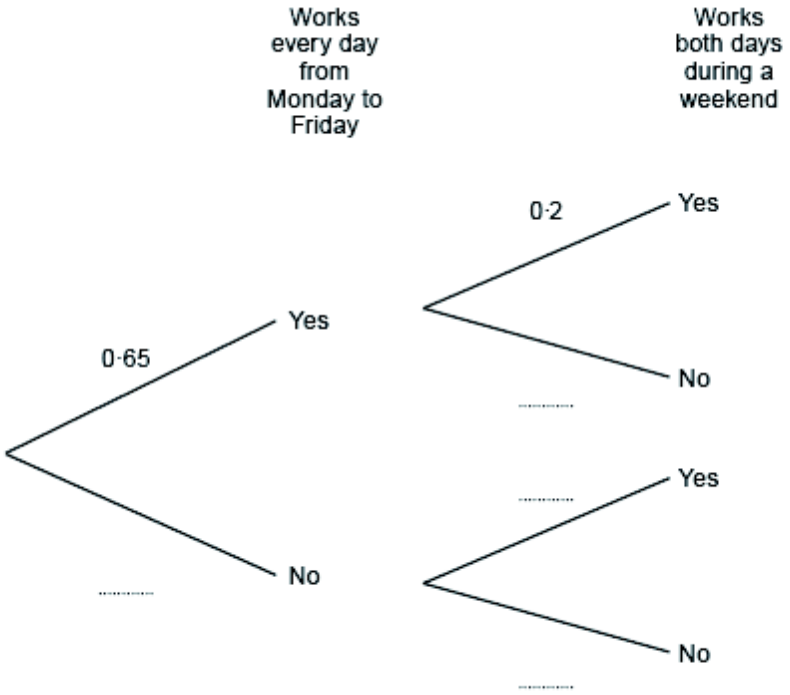
5. Carys has a Monday to Friday job and a weekend job.
Working Monday to Friday and working weekends are independent events.
In any given week, the probability that Carys works every day from Monday to Friday is 0·65.
The probability that she works both days during a weekend is 0·2.

(a) Complete the following tree diagram. [2]



(b) Calculate the probability that next week Carys will work every day from **Monday to Sunday**. [2]

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6. An allotment has two rectangular flower beds A and B.

Flower bed A is x metres long and y metres wide.
Flower bed B is twice as long as flower bed A and is 3 metres wider than flower bed A.

The perimeter of flower bed A is 18 metres.
The perimeter of flower bed B is 34 metres.

Use an algebraic method to calculate the area of flower bed B.
You must show all your working. [6]

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