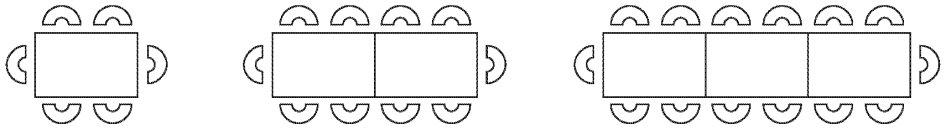
1.

Seating arrangements around 1, 2 and 3 tables are shown below.
Tables must be placed only side by side in one row.



(a) In the space below, draw a seating arrangement for a row of 4 tables. [1]

(b) Complete the following table for the seating arrangements. [2]

Number of tables	**1**	**2**	**3**	**4**	**5**
Number of seats	6	10			

(c) Complete the following formula which connects the number of seats and the number of tables. [2]

Number of seats = ...

(d) How many seats are there around a row of 7 tables? [1]

.....

.....

(e) How many tables are needed for 82 seats? [2]

.....

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2.

You will be assessed on the quality of your written communication in this question.

A window cleaner takes 15 minutes to clean each window in a large building.
He charges using the following formula:

payment = £8 x number of hours worked + call-out charge

Calculate the payment for cleaning 20 windows when the call-out charge is £12. [6]

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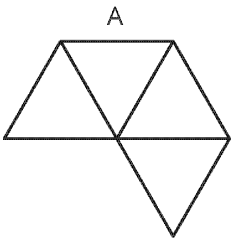
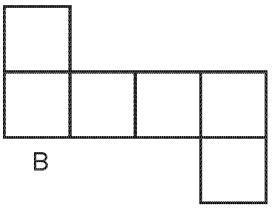
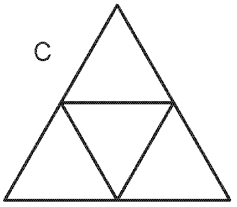
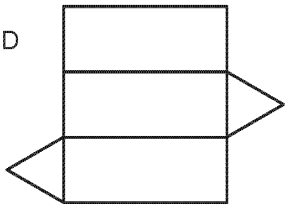
3. Complete the table below to match each 3-dimensional shape with its correct net.
One has been done for you. [4]

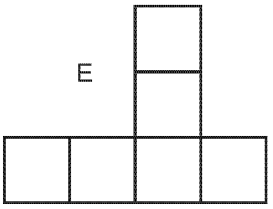
3-dimensional shape	Net
cube	B
cuboid	
triangular prism	
square-based pyramid	
tetrahedron	

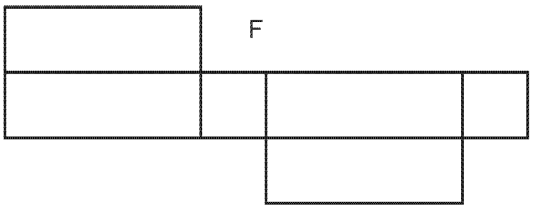


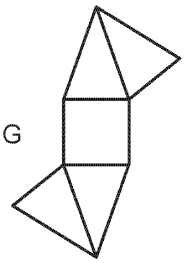












4. Jim and Andy play for their local cricket team.
They scored the following runs in their last six matches.

Jim	42	71	39	62	70	40
Andy	115	6	84	36	10	85

(a) Calculate the mean of Andy's scores.

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.....

.....

Mean is .....

[3]

(b) Find the median of Jim's scores.

.....

.....

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.....

[2]

5. Bronwen grows some flowers.
Each flower is red, yellow or white.
Bronwen picks one of the flowers at random.
The probability that the flower is red is 0·3.
The probability that the flower is yellow is 0·15.
What is the probability that the flower is white? [2]

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6.

In this question you may **only** use the numbers in the following table.

18	13
5	15
21	10

(a) Write down two numbers that add up to 33.

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.....

.....

[1]

(b) Write down a factor of 20.

.....

[1]

(c) Write down a prime number.

.....

[1]

(d) Write down a multiple of 7.

.....

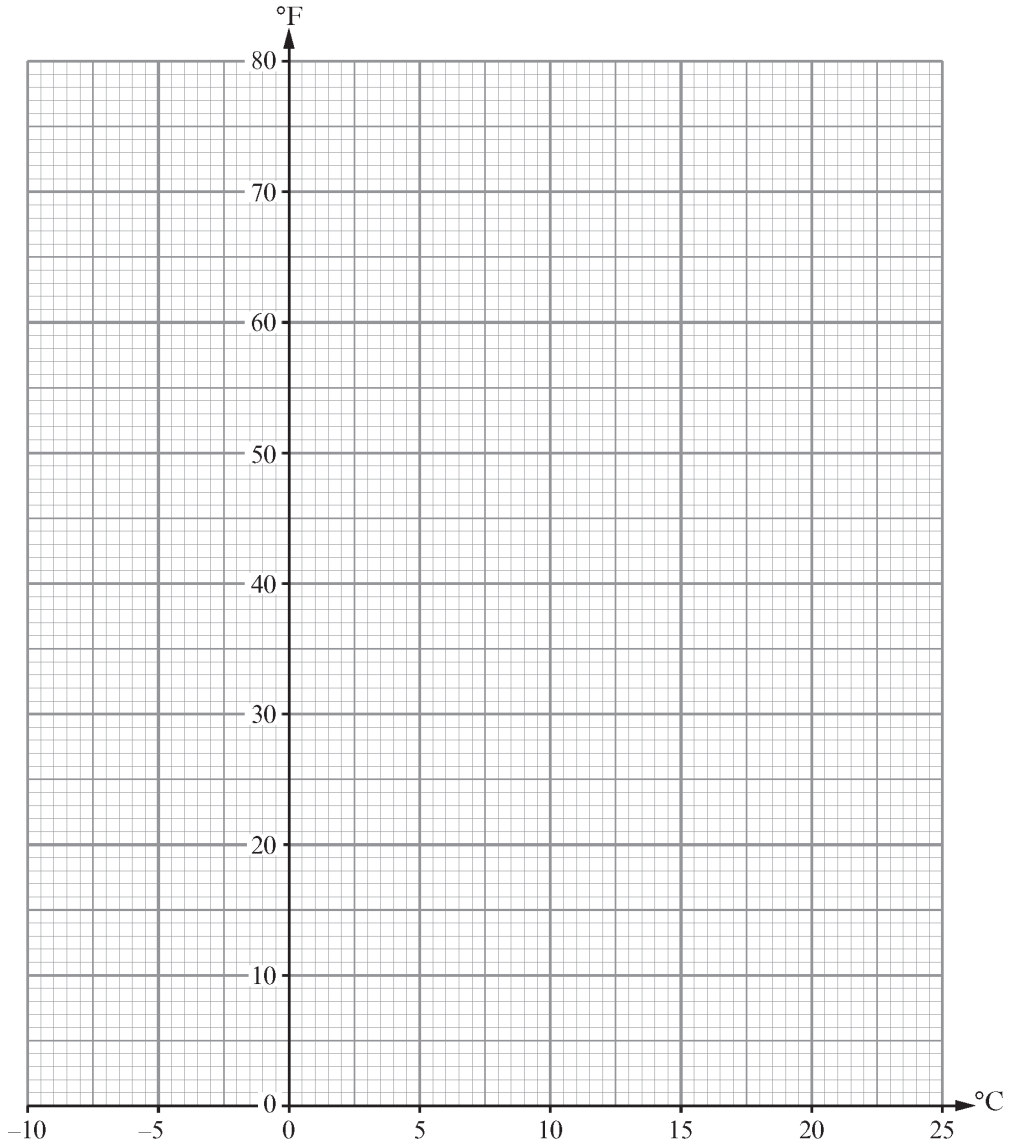
[1]

7.

The table below gives three temperature readings, both in Celsius (°C) and in Fahrenheit (°F).

°C	–5	5	25
°F	23	41	77

(a) On the graph paper below, draw a conversion graph between °C and °F. [3]



(b) Water freezes at 0 °C under normal conditions.
Use your graph to find the temperature, in °F, at which water freezes under normal conditions.

.....

[1]

(c) Which is the higher temperature, 60 °F or 18 °C?
You must give a clear reason for your answer.

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[1]

8.

Two sets of rods of length 1, 2, 4, 8, 16 and 32 cm are available to make shapes.

1 cm	2 cm	4 cm	8 cm	16 cm	32 cm
1 cm	2 cm	4 cm	8 cm	16 cm	32 cm

Rods are joined end to end, with all parts of the rods forming part of the shape.

(a) Show how you could use some of these rods to make an equilateral triangle with sides of length 10 cm.

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.....

[1]

(b) What would be the lengths of the sides of the **largest** possible equilateral triangle that could be made using these rods? You must state which rods are used and how the equilateral triangle is to be made.

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[2]

9.

The graphs below were sketched to represent three of the following four statements:

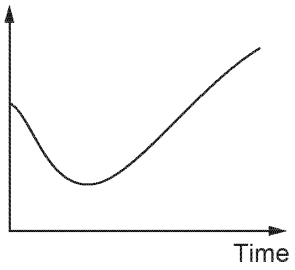
A. An oven warming up until it reaches the required temperature to bake a cake

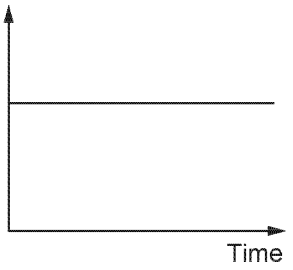
B. The temperature of a cup of coffee as it cools

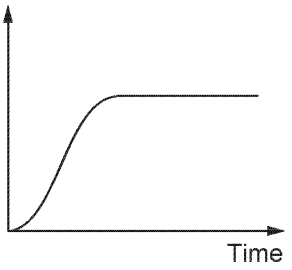
C. Ceri's body temperature remained constant throughout the day

D. The temperature dropped overnight and rose the next morning

Match a statement to each of the following graphs. [3]







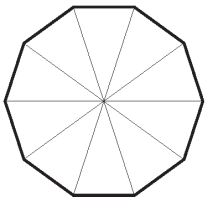
....

10.

(a) Draw a circle around all of the following fractions that are equal to 40%. [2]

$\frac{8}{20}$ $\frac{1}{4}$ $\frac{2}{5}$ $\frac{10}{40}$ $\frac{5}{20}$

(b) Shade 30% of the following figure. [1]



(c) Find, in its simplest form, $\frac{5}{6} - \frac{1}{3}$. [2]

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11.

A company offers its workers a choice on how much their salary will increase next year.
Each worker can receive either a £500 increase or a 2% increase on their present salary.

Janet is currently on a salary of £24 000 per year.

Which option should Janet choose? You **must show the calculations** that support your answer.

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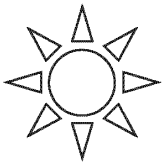
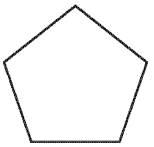
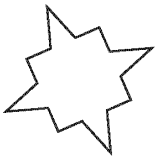
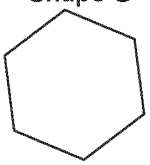
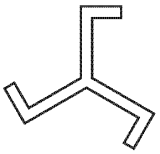
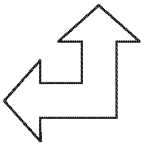
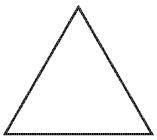
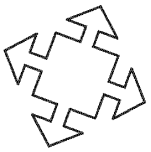
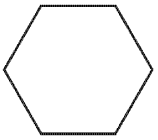
[3]

12.

In a game, Carwyn is asked to select pairs of shapes from the cards given below.

Shape A 	Shape B 	Shape C 	Shape D 	Shape E 
Shape F 	Shape G 	Shape H 	Shape I 	Shape J 
Shape K 	Shape L 	Shape M 	Shape N 	Shape P 

He must select his shapes using given conditions. [5]

Condition 1: Select a pair of shapes that have rotational symmetry of order 3.

Shape ..... and Shape .....

Condition 2: Select a pair of shapes that have exactly 4 lines of symmetry.

Shape ..... and Shape .....

Condition 3: Select a pair of shapes that are congruent.

Shape ..... and Shape .....

Condition 4: Select a pair of shapes that are similar but not congruent.

Shape ..... and Shape .....

Condition 5: Select a pair of shapes that do not have rotational symmetry.

Shape ..... and Shape .....

13.

Solve the inequality $3 - x < 7$. [2]

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14.

(a) Using the numbers

2 **3** **10** **15**

once only in each case, fill in the boxes so that the equations are correct.

(i) $\square + \square = \square - \square$ [1]

(ii) $\square \times \square = \square \times \square$ [1]

(iii) $\square \div \square = \square \div \square$ [1]

(b) Use **two** of the symbols

$+$ $-$ $\times$ $\div$

to make the following equation correct.

$\boxed{6} \quad \boxed{3} = \boxed{21} \quad \boxed{7}$ [1]

15. *(a)* Given that $a = -6$, $b = 3$ and $c = 4$, find the value of each of the following expressions.

(i) $\frac{a^2}{4} - a$ [2]

(ii) $(2b)^3$ [2]

(iii) $\frac{8{\cdot}5a + b}{c}$ [3]

(b) Expand $m(m^2 - 5)$. [2]

16. *(a)* Simplify $3x + 5y + x - 7y$.

.....

.....

[2]

(b) Solve

(i) $\frac{y}{6} = 12$,

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[1]

(ii) $7x - 8 = 20$.

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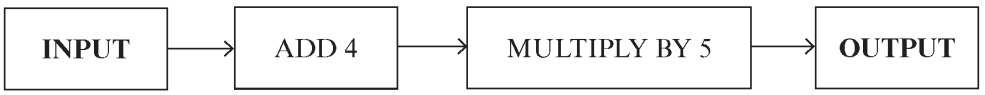
[2]

(c) Here is a number machine.



Write down the OUTPUT when the INPUT is n.

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[2]

17.

Olga wants to paint one side of a garden wall.
The wall is 2 metres high and 35 metres long.

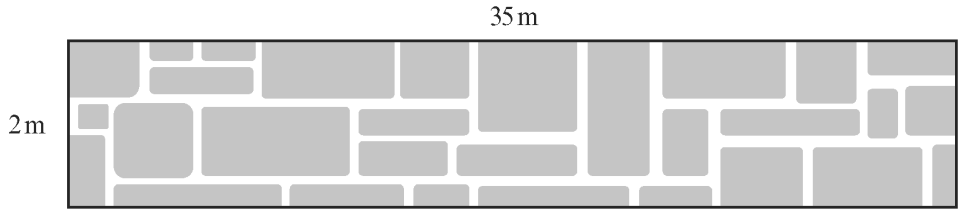

Diagram not drawn to scale

She has found the following information about the special paint that she needs.

- It is only sold in 5 litre and 2 litre tins
- One litre is enough to cover an area of $6\,m^2$
- The tins are sold at a price of
  - £12 for a 5 litre tin
  - £6 for a 2 litre tin

Showing all your calculations, find the least amount she has to pay for enough paint to cover the wall.

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[6]

Marking Scheme

1.

8. (a) Correct diagram	B1	
(b) 14, 18, 22	B2	Award B1 for two correct entries
(c) Number of seats = Number of tables(t) × 4 +2	B2	Accept n for number of tables Award B1 for × 4 + 2 Do not accept 'add four '
(d) 30	B1	FT for equivalent level of difficulty
(e) (82 – 2)/4	M1	FT for equivalent level of difficulty Or equivalent method
=20	A1	
	8	

2.

	✓		**Special cases** Candidates who do 8×20+12 get SC1 for the (£)172 **Similarly SC1 for (£)132 from 8×15+12**
3. Hours = 20 × 15 (minutes) 20 × ¼ (hours) = 300 (minutes) = 5 (hours) Payment = 8 × 5 + 12 = (£) 52	M1 A1 M1 A1	'hours' not required at this stage F.T. 'their time' (must be an attempt to convert to hours).	
Look for • spelling • clarity of text explanations, • the use of £s, hours and minutes QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2	QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling	

3.

F D G C		B1 B1 B1 B1	

4.

6. (a) Mean for Andy = 336 ÷ 6 = 56	M1 m1 A1	Attempt to add all given values for Andy FT 'their 336' CAO
(b) Put in order 39, 40, 42, 62, 70 71 Median of Jim = 52	M1 A1	Sight of 42 and 62 only would gain M1
	5	

5.
6.
7.

7. (a) Plotting all three points correctly. Line drawn through their points.	P2 L1	P1 for 2 correct plots. A correct line implies P2. F.T. their **three** plots. Allow curve or 'dog leg' only if P2 not gained.
(b) 32.	B1	F.T. their line. Allow ± ½ 'small square'.
(c) 18(°C) AND a clear reason given.	B1	Some **correct** use of their graph required. For an accurate graph (or no graph) 18°C needs to be equated to 64°F to 65°F OR 60°F needs to be equated to 15°C to 16°C. Do not accept 'its higher on the line' unless their line has been clearly marked at 60°F and 18°C.

8.

13.(a) A suitable triangle shown or described (b) E.g.32+8+2, 32+8+2, 16+16+4+4 +1+1 (side length 42 cm)	B1 B2 3	Any use of subtraction ideas must be shown (justified) B1 for showing **selection** of rods that make a smaller equilateral triangle of side length >10 cm, OR for knowing sides are 42(cm)

9.

6. D C A	B1 B1 B1 3	

10.

7. (a) $\frac{8}{20}$ $\frac{1}{4}$ $\frac{2}{5}$ $\frac{10}{40}$ $\frac{5}{20}$	B2	B1 for either one correct AND none incorrect OR for both correct and 1 incorrect
7. (b) 3 shaded sectors	B1	
7. (c) $\frac{5}{6} - \frac{2}{6}$ (= 3/6) = 1/2	M1 A1	Or equivalent correct method Must be ½. Unsupported 3/6 gets M1, A0 M1, A1 for (0).5

11.

7. 24000 × 0·02 = (£)480	M1 A1	For any correct method of finding 2% of 24000. <u>*Alternative method*</u> *500 / 24000 × 100 M1* *= 2·08(....%) A1*
Janet should choose the £500 option.	A1 3	A statement must be made. F.T. their '£480'. Ignore any further statements.

12.

4. H and L F and N G and P B and K Any 2 shapes from A, C, D and I	B1 B1 B1 B1 B1 5	Order of letters not important

13.

14. $-x < 7 - 3$ OR $3 - 7 < x$ OR equivalent $x > -4$ OR $-4 < x$		M1 A1	Accept $-3 + x > -7$ as a valid first step. Mark final answer. Solving an equation gets M0A0 unless the 'equals' sign is correctly replaced by an inequality sign.

14.

6.(a) (i) A correct equation formed. (ii) A correct equation formed. (iii) A correct equation formed.		 B1 B1 B1	Must use given numbers once only in each case.
6(b) – ÷		B1	

15.

(a) (i) $\frac{36}{4} - \frac{-6}{4}$ or $\frac{(-6)^2}{4} + 6$ 15	M1 A1	Evidence of substitution with either $(-6)^2 = 36$ or $- -6 = +6$ seen or implied CAO
(ii) $(2\times3)^3$ = 216	M1 A1	Or sight of $2\times3 \times 2\times3 \times 2\times3$ or 8×27 or $6\times6\times6$ or 6^3 CAO
(iii) $\frac{8.5\times-6}{4} + 3$ with an attempt at evaluating $8.5\times(-)6$ - 12	M1 A2	Attempt at evaluating $8.5\times(-)6$ must lead to negative answer A1 for sight of -48/4 or FT 'their $\frac{8.5\times-6}{4}$' + 3 evaluated correctly provided -6 used If no marks SC1 for 13.5 or 13½
(b) $m^3 - 5m$	B2	B1 for each term. **Mark final answer. $m^3 - 5m = 5m^4$ gets B0.**
H1	7	

16.

8. (a) $4x - 2y$	B2	B1 for either in an expression of the form $af(x) \pm bg(y)$ Allow B1 for $4-2y$ OR $4x-2$ etc 4x and $-2y$ separated gets B1 $4x+-2y$ gets B1
8. (b) (i) (y=) 72	B1	Accept embedded answers such as 72/6 = 12
8. (b) (ii) $7x = 28$ $x = 4$	B1 B1	Isolate the x term F.T. $ax = b$ $(a\neq1)$ B0 for 28/7 Accept embedded answers such as $7\times4 - 8 = 20$
8. (c) $5(n + 4)$ OR $(n + 4)5$ OR $5n + 20$	B2	B1 for $5 \times n+4$ OR $n+4 \times 5$. B0 for $5n + 4$

17.

11. (Area =) 2×35 $= 70(m^2)$	M1 A1	 An area must be indicated for a F.T.	 OR if area of wall found Using 5×6 AND 2×6 M1
(Litres required =) $70 \div 6$ $= 11{\cdot}6(.....)$ or 12.	M1 A1	F.T. 'their area'. A0 for 11 remainder 4 unless 12 used later.	$= 30(m^2)$ AND $12(m^2)$ A1
(Need to buy) Two '5l tins' and One '2l tin'.	M1	F.T. 'their required litres'. Must be for cheapest combination possible.	F.T. their area.
(Cost =) (£)30	A1 6		