Name: _____

FOUNDATION MATHS GCSE
NON-CALCULATOR SAMPLE

Envision Tuition

MATHEMATICS TUTORS

Date:

Time: 90 minutes

Total marks available: 80

Total marks achieved: _____

ENVISION TUITION

Questions

Q1.

Write 7829 to the nearest 1000

.....

(Total for question = 1 mark)

Q2.

Work out $(-3)^3$

.....

(Total for question is 1 mark)

Q3.

Write 180 minutes in hours.

..... hours

(Total for question = 1 mark)

Q4.

Work out 20 ÷ (3 + 2)

.....

(Total for question = 1 mark)

Q5.

What is 10% of £50?

£ . . . . . .

(Total for Question is 1 marks)

Q6.

Margaret is going to have a meal.
She can choose one starter and one main course.

Menu

Starter	Main course
Pate	Beef
Melon	Salmon
Ham	Lasagne

Write down all the possible combinations Margaret can choose.

.....

.....

.....

.....

(Total for Question is 2 marks)

Q7.

Stuart throws a biased coin 10 times.
He gets 7 Tails.

Maxine throws the same coin 50 times.
She gets 30 Tails.

Prasha is going to throw the coin once.

(i) Whose results will give the better estimate for the probability that she will get Tails, Stuart's or Maxine's?
You must give a reason for your answer.

.....

(1)

(ii) Use Stuart's and Maxine's results to work out an estimate for the probability that Prasha will get Tails.

.....

(1)

(Total for question = 2 marks)

Q8.

8 identical pens cost £12
Work out the cost of 10 of these pens.

£ .....

(Total for question = 2 marks)

Q9.

* The nth term of sequence A is $3n - 2$
The nth term of sequence B is $10 - 2n$

Sally says there is only one number that is in both sequence A and sequence B.

Is Sally right?
You must explain your answer.

(Total for question = 2 marks)

Q10.

Write these numbers in order of size.
Start with the smallest number.

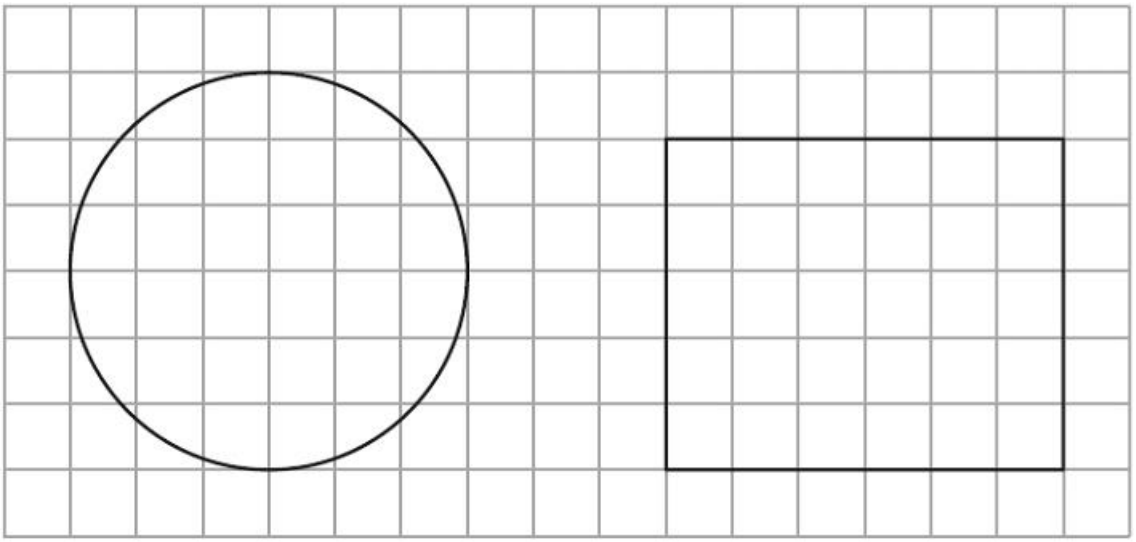
2.5×10^2 0.0025 2.5×10^{-2} 2500

.....

(Total for question = 2 marks)

Q11.

The centimetre grid shows the plan and the front elevation of a cylinder.



Plan

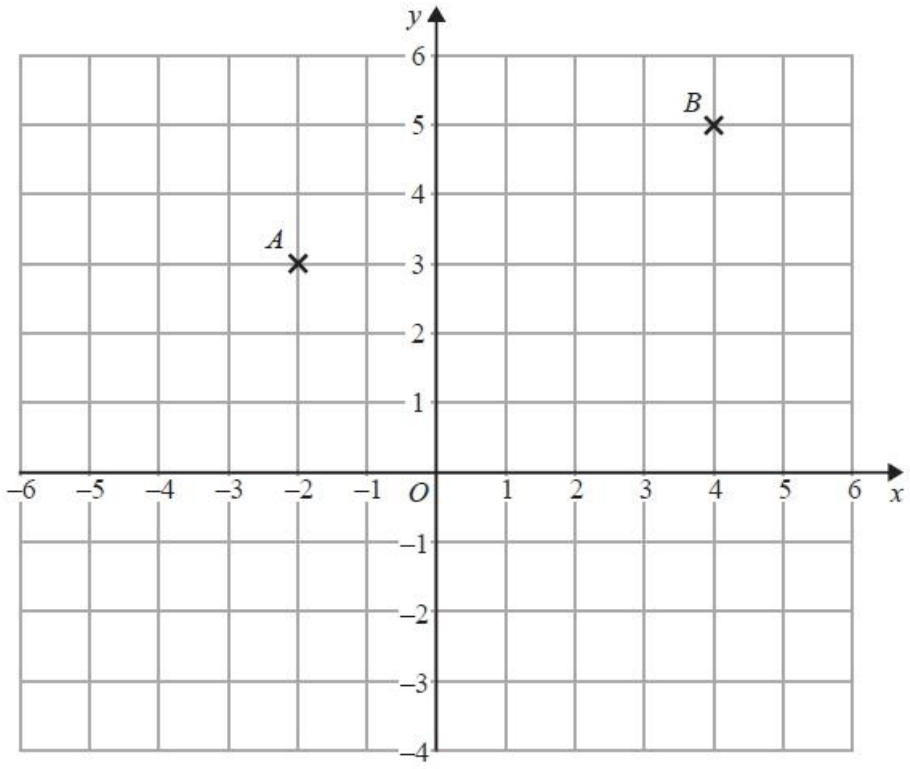
Front elevation

Work out the volume of the cylinder.
Give your answer in terms of π

..... cm^3

(Total for question = 3 marks)

Q12.



(a) Write down the coordinates of point *B*.

(..... , ...)

(1)

(b) Find the coordinates of the midpoint of *AB*.

(..... , ...)

(1)

(c) On the grid, draw the line with equation $y = -3$

(1)

(Total for question = 3 marks)

Q13.

Here is a number machine.

Complete this table for the number machine.

Input	Output
0.5	.....
2	15
3	.....
.....	33

(Total for Question is 3 marks)

Q14.

At the end of 2017

the value of Tamara's house was £220 000
the value of Rahim's house was £160 000

At the end of 2019

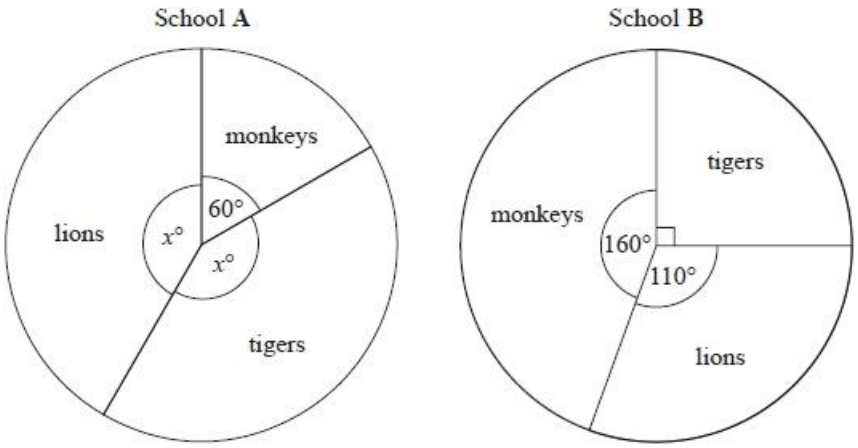
the value of Tamara's house had decreased by 20%
the value of Rahim's house had increased by 30%

At the end of 2019, whose house had the greater value?
You must show how you get your answer.

(Total for question = 4 marks)

Q15.

The pie charts show information about the favourite animal of each student at school **A** and of each student at school **B**.



There are 480 students at school A.

There are 760 students at school B.

Henry says,

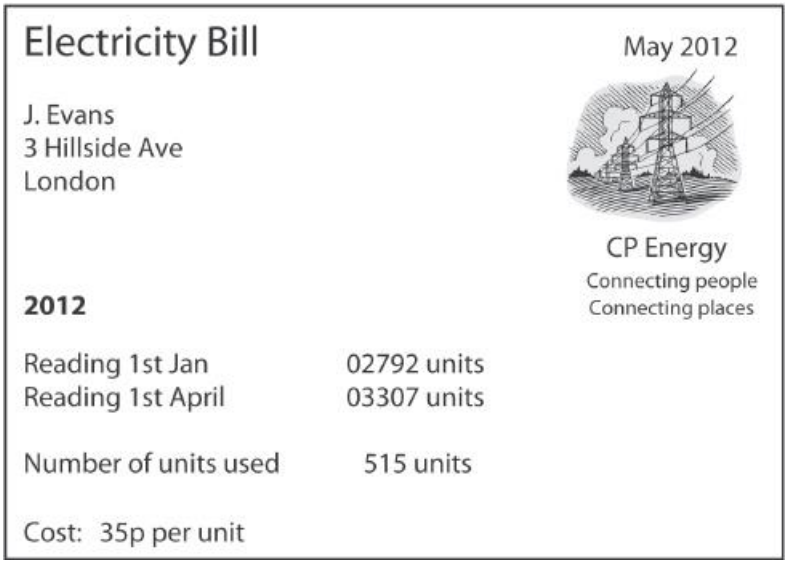
"The same number of students at each school have tigers as their favourite animal."

Is Henry correct?
You must show how you get your answer.

(Total for question = 4 marks)

Q16.

Here is part of Jo's electricity bill



Electricity Bill

May 2012

J. Evans
3 Hillside Ave
London

CP Energy
Connecting people
Connecting places

2012

Reading 1st Jan	02792 units
Reading 1st April	03307 units
Number of units used	515 units

Cost: 35p per unit

Work out how much Jo has to pay for the units she has used.

£ . . . . . .

(Total for Question is 4 marks)

Q17.

* This formula is used to work out the body mass index, *B*, for a person of mass *M* kg and height *H* metres.

$$B = \frac{M}{H^2}$$

A person with a body mass index between 25 and 30 is overweight.

Arthur has a mass of 96 kg.
He has a height of 2 metres.

Is Arthur overweight?
You must show all your working.

(Total for Question is 3 marks)

Q18.

Felicity asked 100 students how they came to school one day.
Each student walked or came by bicycle or came by car.

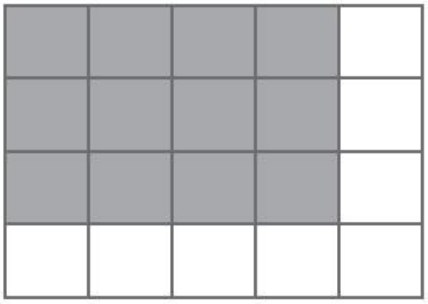
49 of the 100 students are girls.
10 of the girls came by car.
16 boys walked.
21 of the 41 students who came by bicycle are boys.

Work out the total number of students who walked to school.

.....

(Total for Question is 4 marks)

Q19.

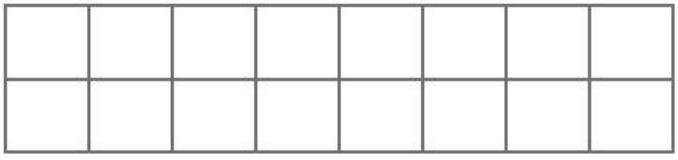


(a) What fraction of this shape is shaded?
Write your fraction in its simplest form.

.....

(2)

(b) Shade $\frac{3}{8}$ of this shape.



(1)

(Total for Question is 3 marks)

Q20.

Matthew has a job.
His normal hourly rate of pay is £10

His overtime hourly rate of pay is $1\frac{1}{2}$ times his normal hourly rate of pay.

Matthew is paid at the normal hourly rate for 7 hours work each day, Monday to Friday.
He does **not** work on Saturday or Sunday.

Here is a table showing the number of hours of overtime he worked each day this week.

	Mon	Tues	Wed	Thur	Fri
Overtime (hours)	3	2	0	1	3

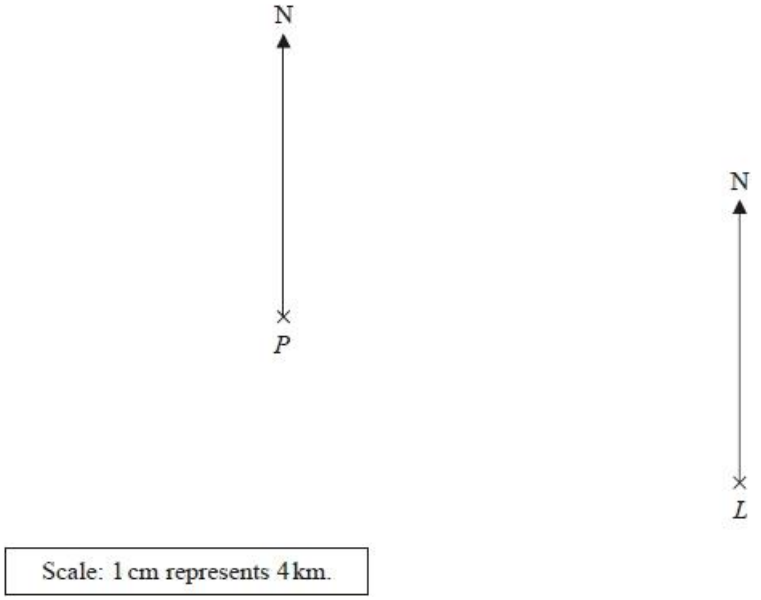
Work out Matthew's total pay for this week.

£ .....

(Total for question = 5 marks)

Q21.

The accurate scale drawing shows the positions of port *P* and a lighthouse *L*.



Aleena sails her boat from port *P* on a bearing of 070°

She sails for $1\frac{1}{2}$ hours at an average speed of 12 km/h to a port *Q*.

Find

(i) the distance, in km, of port *Q* from lighthouse *L*,
(ii) the bearing of port *Q* from lighthouse *L*.

distance *QL* = ... km

bearing of *Q* from *L* = ... °

(Total for question = 5 marks)

Q22.

*Here are the instructions to work out the time, in minutes, needed to cook a chicken.

	25 minutes for each $\frac{1}{2}$ kg
then	add 15 minutes

Lawrence is going to cook a chicken.
The chicken has a weight of 2 kg.

Lawrence wants to finish cooking the chicken at 6 30 pm.

Work out the time he should start to cook the chicken.

(Total for question = 4 marks)

Q23.

(a) Simplify $x^2 \times x^4$

.....

(1)

(b) Simplify $y^8 \div y^6$

.....

(1)

(Total for Question is 2 marks)

Q24.

Here is part of a bus timetable from Harrow Lane to Cartbridge Street.

Harrow Lane to Cartbridge Street

Harrow Lane	08 02	09 04	10 12	11 02	12 04	12 12
Elm Drive	08 19	09 21	10 29	11 19	12 21	12 29
Hamden Road	08 32	09 34	10 42	11 32	12 34	12 42
Swipe Crescent	08 41	09 43	10 51	11 41	12 43	12 51
Cartbridge Street	08 50	09 52	11 01	11 50	12 52	13 01

A bus goes from Harrow Lane to Cartbridge Street.
The bus leaves Harrow Lane at 08 02

(a) At what time should the bus get to Cartbridge Street?

.....

(1)

Here is part of a bus timetable from Cartbridge Street to Harrow Lane.

Cartbridge Street to Harrow Lane

Cartbridge Street	13 11	14 14	15 07	16 11	17 14	18 07
Swipe Crescent	13 20	14 24	15 16	16 20	17 24	18 16
Hamden Road	13 29	14 33	15 25	16 29	17 33	18 25
Elm Drive	13 43	14 47	15 39	16 43	17 47	18 39
Harrow Lane	13 53	14 57	15 49	16 53	17 57	18 49

A bus goes from Cartbridge Street to Harrow Lane.
This bus leaves Hamden Road at 13 29

(b) Work out how many minutes this bus should take to go from Hamden Road to Elm Drive.

.....

(1)

Peter lives in Harrow Lane. His grandmother lives in Swipe Crescent. Peter visits his grandmother. He goes by bus from Harrow Lane to Swipe Crescent. Peter wants to have at least 3 hours with his grandmother. He needs to be back at Harrow Lane by 16 00

*(c) Plan Peter's journey to visit his grandmother and get back to Harrow Lane.
You must include the times of the buses.

.....
.....

(4)

(Total for Question is 6 marks)

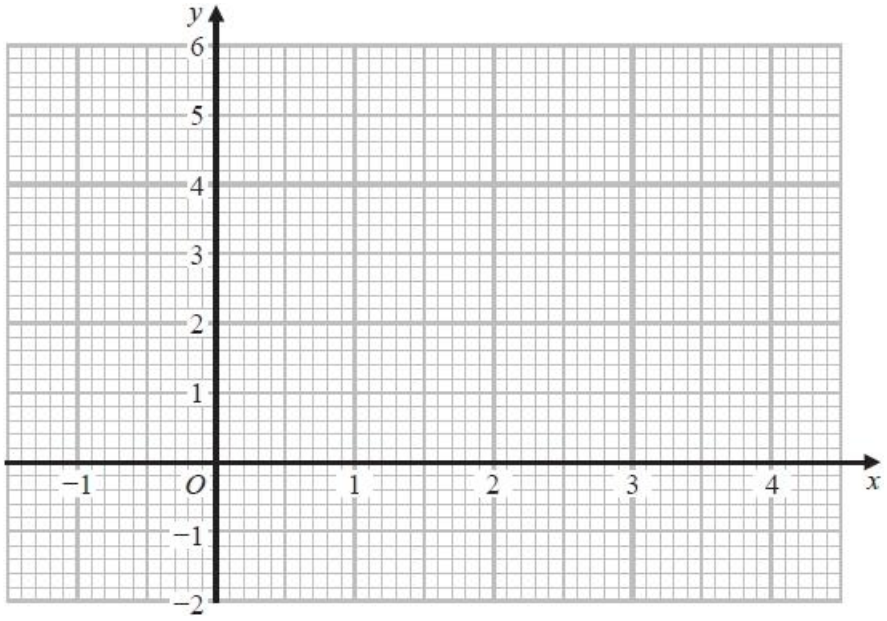
Q25.

(a) Complete the table of values for $y = x^2 - 3x + 1$

x	−1	0	1	2	3	4
y		1	−1			

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x + 1$ for values of x from −1 to 4



(2)

(c) Using your graph, find estimates for the solutions of the equation $x^2 - 3x + 1 = 0$

.....

(2)

(Total for question = 6 marks)

Q26.

Here is a right-angled triangle.

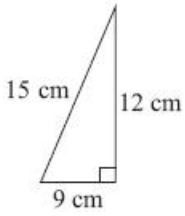


Diagram **NOT** accurately drawn

The shape below is made from 4 of these triangles.

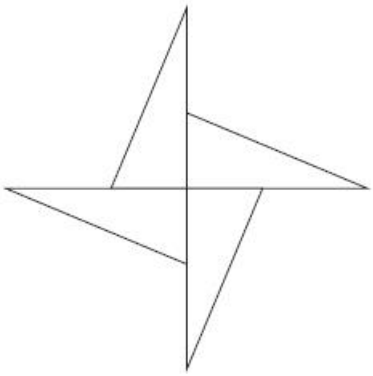


Diagram **NOT** accurately drawn

(a) Work out the area of the shape.

. . . . . cm^2

(3)

(b) Work out the perimeter of the shape.

.....

(3)

(Total for Question is 6 marks)

Mark Scheme

Q1.

Question	Answer	Mark	Mark scheme	Additional guidance
	8000	B1	cao	

Q2.

Paper 1MA1: 1F			
Question	Working	Answer	Notes
		−27	B1 cao

Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
	3	B1	cao	

Q4.

Question	Answer	Mark	Mark scheme	Additional guidance
	4	B1	cao	

Q5.

Question		Working	Answer	Mark	Notes
		50 ÷ 10 or $^{10}/_{100}$ × 50 =	£5	1	B1

Q6.

Question		Working	Answer	Mark	Notes
			(P, B), (P, S), (P, L) (M, B), (M, S), (M, L) (H, B), (H, S), (H, L)	2	M1 for any 3 combinations with no incorrect combinations A1 for all 9 combinations with no duplicates or extras

Q7.

Question	Answer	Mark	Mark scheme	Additional guidance
(i)	Maxine with bigger number of trials	C1	for Maxine with reason **Acceptable examples** She throws the coin more times than Stuart **Not acceptable examples** Maxine throws it 50 times She gets more Tails Stuart (he) ……	
(ii)	$\frac{37}{60}$	B1	for $\frac{37}{60}$ oe	

Q8.

Question	Working	Answer	Notes
		15	M1 For start to scaling process eg 12÷8 or 10÷8 A1 15

Q9.

5MB2F_01 November 2015					
Question		Working	Answer	Mark	Notes
*		1, 4, 7, 10, 13 8, 6, 4, 2, 0	Explanation	2	M1 for listing at least 3 terms of both sequences C1 for Yes and explanation from fully correct working that 4 is in both sequences; numbers in A are increasing; numbers in B are decreasing

Q10.

5MB2H/01 June 2015				
Question	Working	Answer	Mark	Notes
		0.0025 2.5×10^{-2} 2.5×10^{2} 2500	2	M1 for converting all numbers to same form with at least one conversion correct A1 for fully correct order with correct numbers in any correct form (SC B1 if one number incorrectly placed or all 4 numbers listed in reverse order)

Q11.

Question	Answer	Mark	Mark scheme	Additional guidance
	45π	P1	for (area of circle =) $\pi \times 3^2$	
		P1	for (volume =) [area of circle] $\times$ 5	[area of circle] $\times 5 = \pi \times 3^2 \times 5$ or $\pi \times 6^2 \times 5$ or $\pi \times r^2 \times 5$
		A1	cao	

Q12.

Question	Working	Answer	Notes
a		(4, 5)	B1
b		(1, 4)	B1
c		Correct line	B1

Q13.

		Working	Answer	Mark	Notes
	(a)		6	1	B1 cao
	(b)		21	1	B1 cao
	(c)		5	1	B1 cao

Q14.

Question	Answer	Mark	Mark scheme	Additional guidance
	Rahim (supported)	P1	for start to the process to find 20% for Tamara, eg 220000 × 0.2 oe (= 44000) **or** 30% for Rahim, eg 160000 × 0.3 oe (= 48000) **OR** for 1 – 0.2 (= 0.8) **or** 100 – 20 (= 80) **or** 1 + 0.3 (= 1.3) **or** 100 + 30 (= 130)	Build up processes are acceptable but must be complete and correct
		P1	for a complete process to find at least one new value, eg 220000 – "44000" (= 176 000) **or** 160000 + "48000" (= 208000) **OR** 220000 × "0.8" (=176000) **or** 160000 × "1.3" (=208000)	
		A1	for one correct value, 176 000 or 208 000	
		C1	for correct conclusion supported by correct figures eg Rahim, 176 000 and 208 000	Award 0 marks for a correct answer with no supportive working.

Q15.

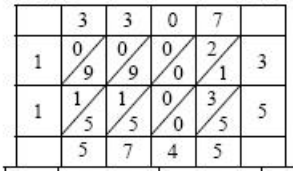
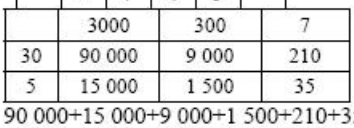
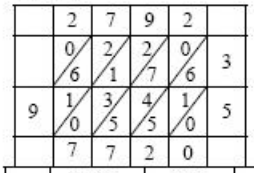
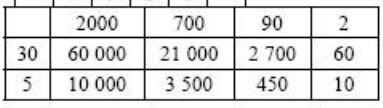
Question	Answer	Mark	Mark scheme	Additional guidance
	No with fully correct figures	M1	for $(360 - 60) \div 2$ (= 150) or $\frac{60}{360} \times 480$ (= 80) oe	Angle of 150° may be seen on diagram
		M1	(dep) for method to find required number of students in School **A** eg $\frac{"150"}{360} \times 480$ (= 200) or (480 – "80") ÷ 2 (= 200)	
		M1	for method to find required number of students in School **B**, eg $\frac{"90"}{360} \times 760$ (= 190) or 760 ÷ 4 (= 190)	ft the angle of 90 eg from 360 – 160 – 110 calculated incorrectly, or measured incorrectly from the diagram within the range 88 to 92
		C1	for No with correct figures **Acceptable examples** No, 200 and 190 He is wrong, School A has 10 more **Not acceptable examples** Yes …. No, School A had 20 more [incorrect figures]	

Q16.

Question	Working	Answer	Mark	Notes
	515 × 35 2575 15450 18025 10 × 515 = 5150 10 × 515 = 5150 10 × 515 = 5150 5 × 515 = 2575 18025 15 000 + 2500 + 300 + 50 + 150 + 25 =18 025 3307 10 × 3307 = 33070	£180.25	4	M1 for 515 × 0.35 or 515 × 35 This may be implied from an incomplete method of multiplication M1 for a complete method with relative place value correct. Condone one multiplication error, addition not necessary Or for a complete grid, condone one multiplication error, addition not necessary Or for sight of a complete partitioning method. Condone one multiplication error final addition not necessary M1 (dep on the previous M1) for addition of appropriate elements of the calculation

	5	1	5	
1	1 / 5	0 / 3	1 / 5	3
8	2 / 5	0 / 5	2 / 5	5
	0	2	5	

	500	10	5
30	15 000	300	150
5	2500	50	25

		35 × 10 × 3307 = 33070 16535 10 × 3307 = 33070 99210 5 × 3307 = 16535 115745 115745   90 000+15 000+9 000+1 500+210+35 2792 10 × 2792 = 27920 35 × 10 × 2792 = 27920 13960 10 × 2792 = 27920 83760 5 × 2792 = 13960 97720 97720   115 745 – 97 720 = 18 025			A1 for £180.25(p) or 18025p (with '£' sign deleted) OR M1 for 3307 × 0.35 – 2792 × 0.35 or 3307 × 35 – 2792 × 35 M1 for a correct method of multiplication of at least one product, using digits 3307 and 35 or 2792 and 35 Condone one multiplication error, addition not necessary M1 (dep on the previous M1) for addition of appropriate elements of the calculation A1 for £180.25 or 18025p (with '£' sign deleted)

	3	3	0	7			
1	0/9	0/9	0/0	2/1	3		
1	1/5	1/5	0/0	3/5	5		
	5	7	4	5			

	3000	300	7
30	90 000	9 000	210
5	15 000	1 500	35

	2	7	9	2			
	0/6	2/1	2/7	0/6	3		
9	1/0	3/5	4/5	1/0	5		
	7	7	2	0			

	2000	700	90	2
30	60 000	21 000	2 700	60
5	10 000	3 500	450	10

Q17.

Question		Working	Answer	Mark	Notes
*		$96 \div 2^2$ $= 96 \div 4$ $= 24$	No + calculations	3	M1 for $96 \div 2^2$ oe A1 for 24 C1 dep on M1for "No" **with** a calculation to support their conclusion **SC B1:** for $96 \div 2$ **and** a correct conclusion seen **NB** To award the marks in this question working **must** be shown

Q18.

Question		Working	Answer	Mark	Notes
		e.g. 41 – 21 (=20) 49 – 10 – 20 (=19) 16 + 19 = 35 OR (100 – 49) – (16 + 21) (=14) 14 + 10 (=24) 100 – (41 + 24) = 35 w b c Boys 16 21 **14** **51** Girls **19** **20** 10 49 **35** 41 **24** 100	35	4	M1 for 41 – 21 (= 20) or M1 for 49 – 10 – '20' (= 19) M1 for 16 + '19' A1 cao OR M1 for 100 – 49 (=51) M1 for '51' – 21 – 16 (= 14) **and** '14' +10 (= 24) M1 for 100 – (41 + '24') A1 cao NB working may appear in table or diagram

Q19.

Question		Working	Answer	Mark	Notes
	(a)	$^{12}/_{20}$	$^{3}/_{5}$	2	M1 for a fraction equivalent to $^{12}/_{20}$, unsimplified A1 cao [SC: B1 for $^{2}/_{5}$ if M0 scored]
	(b)		6 cells shaded	1	B1 for any 6 cells shaded

Q20.

Question	Working	Answer	Mark	Notes
		485	5	M1 for a method to find weekly basic pay e.g. 7 × 10 (= 70) **and** "70" × 5 (= 350) M1 for a method to find overtime rate e.g. 10 + 5 or 1½ × 10 (=15) M1 for a method to find total overtime pay e.g. (3 + 2 + 1 + 3) × "15" (=135) M1 for a method to find total pay e.g. "350" + "135" A1 cao **or** M3 for method to calculate pay per day for 5 days e.g. Mon 70 + 45 (= 115), Tues = 70 + 30 (= 100), Wed = 70, Thurs = 70 + 15 (= 85), Fri = 70 + 45 (= 115) (M2 for method to calculate pay per day for 3 or 4 days) (M1 for method to calculate pay per day for 1 or 2days except Wednesday) M1 for totalling all five days e.g. "115" + "100" + "70" + "85" + "115" A1 cao **or** M1 for a method to find overtime hours e.g. 3 + 2 + 1 + 3 (= 9) **and** weekday hours 7 × 5 (=35) M1 for a method to find equivalent time on overtime e.g "9" + "9" ÷ 2 M1 for a method to find total equivalent time e.g. "13.5" + "35" M1 for a method to find total pay e.g "48.5" × 10 A1 cao **SC** B2 for answer of 575

Q21.

Question	Answer	Mark	Mark scheme	Additional guidance
(i)	Distance in the range 20 to 23	P1	for a process to draw a bearing of 070°, eg. a line drawn 70° from the North line at *P*	Accept a line of any length as long as the intention is clear.
(ii)	Bearing in the range 317 to 330	P1	for a process to work out the distance *PQ*, eg. 12 × 1.5 (= 18)	
		P1	(dep previous P1) for the process to use the given scale eg. "18" ÷ 4 (= 4.5 cm)	Award P3 for Q shown in the correct place on the diagram. 4.5 scores 2 marks provided there is a link to 12 × 1.5 (= 18)
		A1	(dep P3) for distance in the range 20 to 23	Award no marks if no supportive processes
		A1	(dep P3) for bearing in the range 317 to 330	Award no marks if no supportive processes Award A0A0 if *Q* is not in the correct place

Q22.

Question	Working	Answer	Mark	Notes
*		4 35 pm	4	M1 for 4 × 25 (= 100 (min)) M1 for "100" + 15 (= 115) (min) M1 for 6 30 – "1hr 55 min" C1 for correct time with pm e.g.4 35 pm or16 35(oe) **or** M1 takes off 15 min e.g. 6 30 − 15 (= 6 15) M1 takes off 25 min 4 times e.g "6 15"→5 50→5 25→ 5 00→ 4 35 **or** 6 30 →6 05 →5 40 → 5 15 → 4 50 M1 takes off 15 min **and** takes off 25 min 4 times C1 for correct time with pm e.g 4 35 pm or 16 35(oe)

Q23.

Paper: 5MB2F_01					
Question		Working	Answer	Mark	Notes
	(a)		x^6	1	B1 cao
	(b)		y^2	1	B1 cao

Q24.

Question	Working	Answer	Mark	Notes
(a)		08 50	1	B1 for 08 50 or 8 50 (am) or 10 to 9
(b)	13 43 – 13 29	14	1	B1 cao
(c)*	e.g. HL to SC: 11 02 – 11 41 Visit (at least 3 hours) SC to HL: 15 16 – 15 49 [Note : there are 9 possible solutions]	A fully correct plan showing departure times and arrival times of the two bus journeys	4	B1 for a departure time of 08 02 or 09 04 or 10 12 or 11 02 from HL M1 (indep) for a correct arrival time at SC and a correct departure time from SC (or Cartbridge St) which allows for a stay of at least 3 hours in SC (the differencing does not have to be seen) OR for correctly adding 3 hours to a their arrival time at SC B1 for a departure time from SC of 13 20 (13 11 from CS) or 14 24 (14 14 from CS) or 15 16 (15 07 from CS) C1 (dep on M1) for a complete correct plan which includes the departure and arrival times of the two bus journeys [Note: bus departure times may be identified by their starting times. Eg the 15 07 from Cartbridge Street would be acceptable for the identification of the bus which arrives a HL at 15 49]

Q25.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	5,(1),(-1),-1,1,5	B2	for all 4 values correct	
		(B1	for 2 or 3 correct values)	
(b)	Graph drawn	B2	for a fully correct graph	Accept a freehand graph drawn that is not made of line segments Ignore anything drawn outside the required range
		(B1	ft (dep on B1in (a)) for plotting at least 5 of the points from their table correctly)	
(c)	0.3 to 0.5 and 2.5 to 2.7	M1	for a correct method, eg marking intercepts with x-axis **or** one correct solution **or** both solutions given as a coordinates, eg (0.4, 2.6) **or** (0.4, 0) **and** (2.6, 0)	ft their graph for this mark Accept these coordinates reversed
		A1	for answers in the range 0.3 to 0.5 and 2.5 to 2.7 **or** ft their graph with at least 2 solutions	

Q26.

Question		Working	Answer	Mark	Notes
	(a)	½ × 9 × 12 54 × 4	216	3	M1 for 9 × 12 or 108 seen or better M1 (dep) for "108" ÷2 × 4 oe A1 cao OR SC B1 for 432 seen
	(b)	Work with whole shape: 12 − 9 4 × (3 + 15) Work with 4 triangles: 15 + 12 + 9 = 36 4×36=144 144 – (9×8) = Work with single triangles: 15 + 12 + 9 = 36 4×(36-18) =	72	3	M1 12 - 9 (=3) M1 for 4 × ("3" + 15) oe A1 cao OR M1 for 4×(15 + 12 + 9) (=144) M1 for '144'-9×8 oe A1 cao OR M1 (15 + 12 + 9) - (2 × 9) (=18) oe M1 for 4× "18" oe A1 cao