THE SIPRO MOCK 2023

MATHEMATICS

Time Allowed: *2 Hours 30 Minutes*

	Random No.						Personal No.		
Index No.									

Candidate's Name: _____

Candidate's Signature: _____

School Random No: _____

District ID: _____

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. This paper has two sections: **A** and **B**.
2. Section **A** has **20** questions **(40 Marks)**.
3. Section **B** has **12** questions **(60 Marks)**.
4. Attempt all questions in both sections. All answers to both sections A and B must be written in the spaces provided.
5. All answers must be written in blue or black ball point pens or ***ink***. Only diagrams and graph work must be done in ***pencil***.
6. Unnecessary ***alteration/crossing*** of work will lead to loss of marks.
7. Any ***handwriting*** that cannot be easily read may lead to loss of marks.
8. Do not fill anything in the boxes indicated:

"FOR EXAMINER'S USE ONLY"

For Examiner's Use Only;

PAGES	MARKS	INITIALS
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Please turn over

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SECTION A: 40 MARKS

*Questions **1** to **20** carry **two** marks each*

1. **Work out:** $\frac{7}{9} - \frac{5}{9}$

2. Write in **figures**; Seven thousand, four hundred thirty-three.

3. **Simplify**: 3k + 2y - 4k + 5y + 7k

4. Work out the **LCM** of 12 and 36.

5. Work out: $9\overline{)2763}$

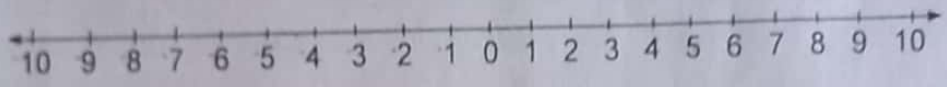
6. Find the **next two** numbers in the sequence.
   1, 3, 6, 10, 15, _____, _____

7. Jumba **deposited sh. 200,000** in a bank that offers an interest rate of $7\frac{1}{2}$% per month for $1\frac{1}{3}$ years. How much **interest** did he receive?

8. What **base two** number has been expanded to give:
$(1x100)_{two} + (1x10)_{two} + (1x1)_{two}$?

9. The subsets that can be formed from set N are $\emptyset$, {1}, {2}, {1, 2}.
Find the number of **proper subsets** that can be formed from set N.

10. Show: **-3 + +5** on the number line below.



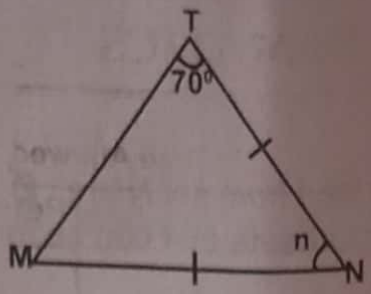
11. **Work out**:

years	months
7	0 5
- 2	1 0

12. Fill in the two missing **equivalent** whole numbers.
2(finite 7) = 2, 9, 16, _____, _____

13. Change **4800 metres** into **dm**.

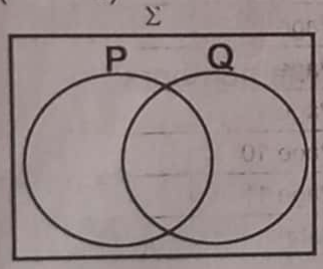
14. The figure below is a triangle **MTN**. Find the **value** of **n** in degrees.



15. **Subtract** 3k - 5 **from** 7k + 2.

16. Express **0.0082** in standard form.

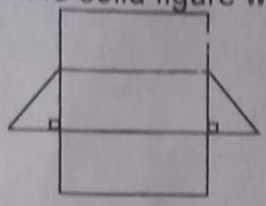
17. Shade $(P \cap Q)^1$ in the venn diagram below.



18. Walusansa scored the following **points** in a game:
6, -7, 8, 0 and -10. Find the range of score.

19. The bursar of Step by Step Junior School made a money withdrawal of ten thousand shillings notes numbered consecutively from **MK 5648** to **MK 5690** from a bank. How much was her withdrawal?

20. Name the solid figure whose net is drawn below.



SECTION B: 60 MARKS

Marks for each part of the question are indicated in the brackets.

21. The table below shows the arrival and departure time for a bus which travelled from Iganga to Masaka. *Study and use it to answer the questions that follow.*

TOWN	ARRIVAL TIME	DEPARTURE TIME
Iganga		8:30am
Jinja	9:10am	9:20am
Kampala	10:25am	10:35am
Masaka	12:00 noon	

a) At what **time** did the bus leave for **Jinja**?

(01 mark)

b) Express the arrival time in Masaka in a 24 hour clock system.

(01 mark)

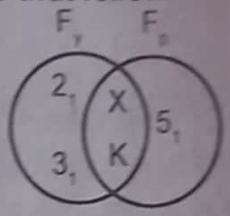
c) How long did the bus take to **travel** from Iganga to Masaka?

(02 marks)

22.a) Four pieces of wire measuring **48m**, **36m**, **24m** and **60m** are to be cut into an exact number of pieces without wastage. What is the **length** of the longest piece of wire that can be cut from each wire?

(02 marks)

Study the **prime factors** *on the venn diagram below and use it to answer the questions that follow.*



b) Given that the GCF of F_Y and F_P is 6, find the;

i) **LCM** of F_Y and F_P

(02 marks)

ii) **value** of Y.

(02 marks)

23.The **interior angle** sum of a regular polygon is **720°**.

a) **Name** the polygon.

(03 marks)

b) Find its **number** of;

i) triangles

(02 marks)

ii) right angles

(02 marks)

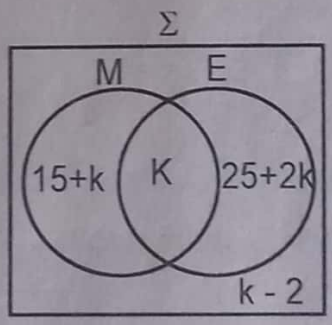
24. 50% of the pupils in the class are above **12 years**. **20%** of the remainder are **11 years** and the rest are below 11 years.
    a) What **percentage** of children are below **11years**?

(03 marks)

b) If **12 pupils** are below **11 years**, how many pupils are in the class?

(02 marks)

25. The venn diagram below shows the number of pupils who like Mathematics (M) and English (E) at St Andrew's Molly Foundation School - Pabo.



If the **difference** between the number of pupils who don't like Mathematics and that of those who like it is 13;
a) Find the value of **K**.

(03 marks)

b) What is n(**M U E**)?

(02 marks)

c) If a pupil is chosen randomly from this school as the head prefect, what is the **probability** that they like maths?

(01 mark)

26. Wasswa is **four times** as old as his son. In 6 years time, the difference in their ages will be **30 years**.

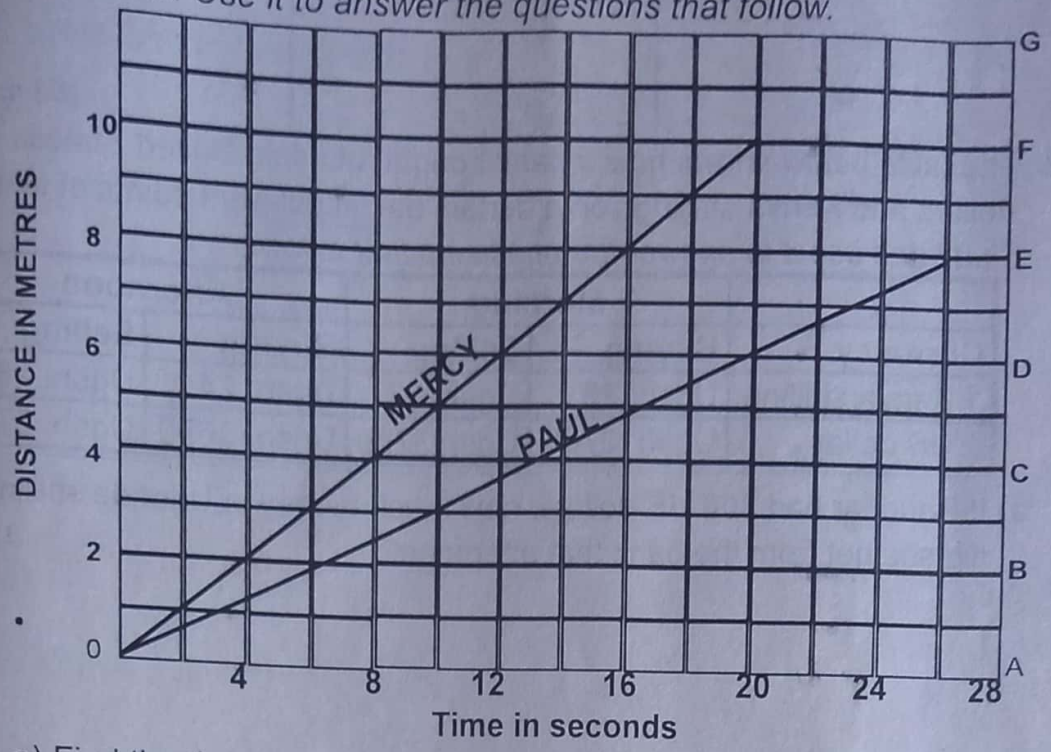
a) How old is Wasswa now?

(03 marks)

b) How old was **Wasswa's son** 3 years ago?

(02 marks)

27. The graph below shows the distance covered by two babies Mercy and Paul. Use it to answer the questions that follow.



a) Find the time each baby took to cover a distance of 6m.

i) Paul _____

ii) Mercy _____

(02 marks)

b) How far was Paul by the time Mercy reached point **F**?

01 mark)

c) What **distance** did Paul cover in **16 seconds**?

(01 mark)

28. The sum of the **values** in the table below are the same vertically, holizontally and diagonally.

9	t	7
4	k	8
n	10	3

a) Find the **magic** sum.

(01 mark)

b) Work out the value of;

(i) n | (ii) t | (iii) k

(03 marks)

29. The table below shows how a bank bought and sold United States dollars and Kenya shillings on a certain day at different points of time. *Study and use it to answer the questions that follow.*

	Morning		Afternoon	
Currency	**Buying**	**Selling**	**Buying**	**Selling**
1 Kenya shilling	Ugsh. 25	Ugsh. 27	Ugsh. 24	Ugsh. 28
1 US dollar	Ugsh. 3700	Ugsh 3750	Ugsh. 3690	Ugsh. 3760

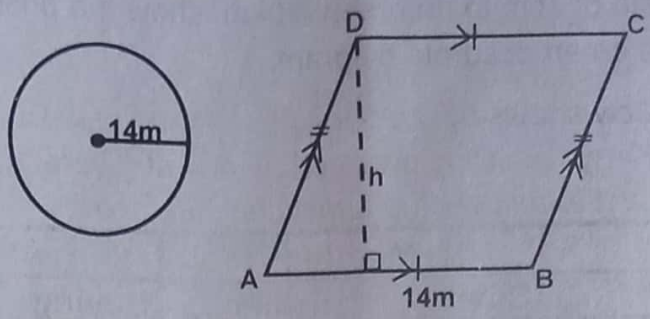
a) If Raudhar had **300 US** dollars, how much money in Uganda shillings did she get from the bank that afternoon?

(02 marks)

b) Given that Ruto has **18000 Kenya** shillings, how many **US dollars** did he get from this bank if this transaction took place at around 9:30am?

(04 marks)

30. The diagram below shows a parallelogram ABCD and a circle of radius 14m. If the area of the parallelogram is $\frac{1}{4}$ of the area of the circle, find the value of **h**.



(04 marks)

31.a) Round off **347** to the nearest tens.

(02 marks)

b) Expand **4219** using exponents.

(02 marks)

32. Town **P** is 60km east of town **Q**. Town **R** is 50km from town **P** on a bearing of 240°.

a) Using a scale of 1cm to represent 10km, show the position of the **three** towns on an accurate diagram.

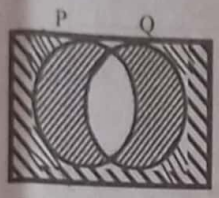
(04marks)

b) Find the **shortest** distance between town **R** and town **Q**.

(01mark)

THE SIPRO MOCK MATHEMATICS MARKING GUIDE – 2023

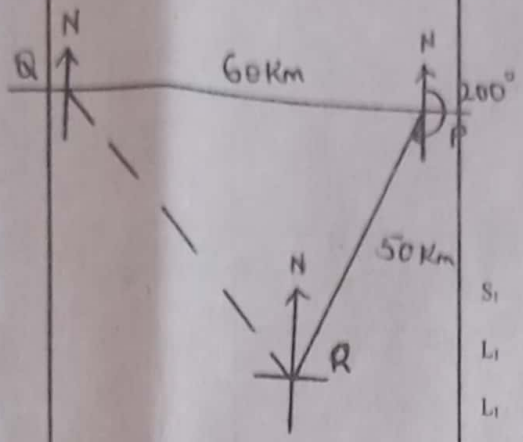
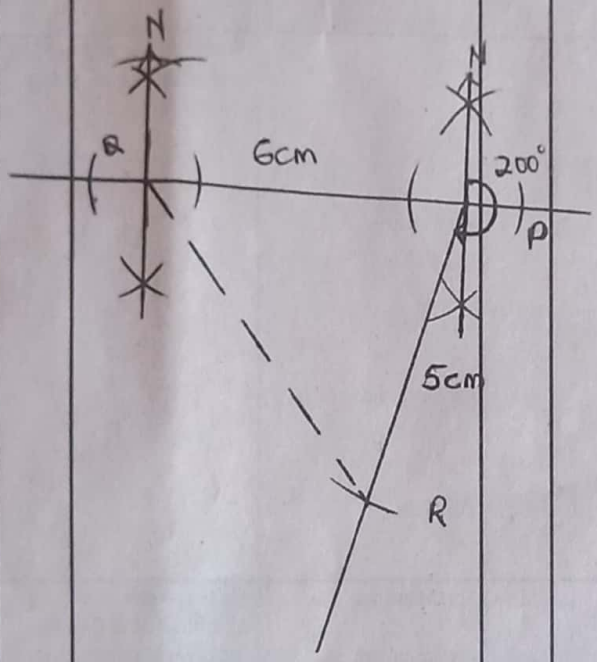
NO.	LEVEL	SOLUTION	AWARD	REASON	TECHNICAL ADVICE
1.	P.2	$\frac{7}{9} - \frac{5}{9} = \frac{7-5}{9}$ $= \frac{2}{9}$	B_2	For correct answer	Operate fractions with different denominators.
2.	P.3	7,000 +433 7,433	M_1 A_1	For the method. For the answer.	Revisit writing figures in words.
3.	P.5	$3k + 2y - 4k + 5y + 7k$ $3k + 7k - 4k + 2y + 5y$ $10k - 4k + 7y$ $6k + 7y$	B_1 B_1	For collecting like terms For the answer.	Encourage candidates to apply the rules of integers in collecting like terms.
4.	P.4	2 | 12 | 36 2 | 6 | 18 3 | 3 | 9 3 | 1 | 3 1 | 1 $(2 \times 2) \times (3 \times 3)$ 4×9 36	M_1 A_1	For the method. For the answer.	Accept the candidate who has used the multiples.
5.	P.6	307 9|2763 -27 06 -0 63 -63 00	B_2	For the answer	Revisit converting Hindu Arabic to Roman numerals.
6.	P.5	1, 3, 6, 10, 15, 21, 28 +2 +3 +4 +5 +6 +7	B_1 B_1	For 21 For 28	Accept 1,3,6,10,15,21,28 (triangular numbers)
7.	P.6	SI = P x R x T Sh 200,000 x $\frac{15}{200} \times \frac{4}{3}$ Sh $\frac{200,000}{1} \times \frac{\cancel{15}^{5}}{\cancel{200}_{1}} \times \frac{4^{2}}{\cancel{3}_{1}}$ Sh 2,000 x 10 Sh 20,000	M_1 A_1	For the method. For the answer.	Help candidates to understand the meaning of the terms used e.g. principle, rate and time.
8.	P.7	100_{two} 10_{two} $+ \ 1_{two}$ 111_{two}	B_2	For the answer	Accept any other method leading to correct answer.
9.	P.7	Set N = {1, 2} Proper subsets = $2^n - 1$ $2^2 - 1$ $(2 \times 2) - 1$ $4 - 1$ = 3proper subsets	M_1 A_1	For the method. For the answer.	Make a review on listing proper subsets.
10.	P.5	$^{+}(^{+}5)$ -3 -3 -2 -1 0 1 2 3 4 5 6 7 8 $^{-}2$	B_1 B_1	For $^{+}(^{+}5)$ For $^{-}2$	Encourage candidates to count gaps when using a number line.

11.	P.4	Years months 3 05 12 + 5 -2 10 =17 1 07	B_1 B_1	For the method. For the answer.	Make a review on operation of time, weeks and days etc.
12.	P.6	2(finite 7) = 2, 9, 16 23, 30	B_1 B_1	For 23 For 30	Operate numbers using finite system and apply the dial.
13.	P.5	10m = 1dm 1m = $\frac{1}{10}$ dm 4800m = (4800 x $\frac{1}{10}$)dm = 480dm	M_1 A_1	For the method. For the answer.	Revisit metric conversion.
14.	P.7	$n + 70^0 + 70^0 = 180^0$ $n + 140^0 - 140^0 = 180^0 - 140^0$ $n = 40^0$	M_1 A_1	For the method. For the answer.	Expose candidates to figures with properties.
15.	P.6	7k + 2 - (3k - 5) 7k + 2 - 3k + 5 7k - 3k + 2 + 5 4k + 7	M_1 A_1	For the method. For the answer.	Help candidates to apply the rules of integers.
16.	P.7	0.0082 x 10 = 00.082 00.082 x 10 = 000.82 000.82 x 10^{-3} = 8.2 = 8.2 x 10^{-3}	M_1 A_1	For the method. For the answer.	Make a review on 8.2×10^{-3} to the original number.
17.	P.7	$(P \cap Q)^1$  	B_2	For the answer	Make a review on set descriptions
18.	P.6	Range = H- L 8 –10 8 – (- 10) 8 + 10 = 18	M_1 A_1	For the method. For the answer.	Encourage candidates to make use of multiplier rules.
19.	P.6	Mk 5 6 9^8 ^{1}0 Mk 5 6 4 8 42 + 1 43 43 x sh 10,000 Sh 430,000	B_1 B_1	For 43 notes For the answer	Help candidates to understand why one is added.
20.	P.6	triangular prism	B_2	For the answer	Expose candidates to all solid shapes with their nets.
		SECTION B			
21.	P.7	a) At 9 : 20am	B_1	For the answer	Make a review on timetables in both 12 and 24 hour clock system.
		(b) Midday =1 2 : 00 hours	B_1	For the answer	
		(c) Hours min 12^1 : $\cancel{00}^{60}$ -8 : 00 3 : 30 3 : 30 + : 30 4 : 00	M_1 A_1	For the method. For the answer.	

		It takes 4 hours			
22.	P.6	a) 2 | 48m | 36m | 24m | 60m 2 | 24 | 18 | 12 | 30 2 | 12 | 9 | 6 | 15 2 | 6 | 9 | 3 | 15 3 | 3 | 9 | 3 | 15 3 | 1 | 3 | 1 | 5 5 | 1 | 1 | 1 | 5 1 | 1 | 1 | 1 $(2 \times 2) \times (2 \times 2) \times (3 \times 3) \times 5$ $(4 \times 4) \times (9 \times 5)$ 16×45 $= 720m$	M_1 A_1	For the method. For the answer	Expose candidates to application of L.C.M
	P.5	b) (i) L.C.M = $P_2 \cup P_3$ $(2 \times 3) \times 6 \times 5$ $(6 \times 6) \times 5$ 36×5 180	M_1 A_1	For the method. For the answer.	
		(ii) $y = (2 \times 3) \times 6$ $= 6 \times 6$ $= 36$	B_2	For the answer	
23.	P.7	a) $1800 (n-2) = int < sum$ $180^0 (n - 2) = 720^0$ $180 n - 360^0 = 720^0$ $180^0 n - 360^0 + 360^0 = 720^0 + 360^0$ $180^0 n = 1080^0$ $180^0 n = 1080^0$ $\frac{180^0 n}{180^0} = \frac{1080^0}{180^0}$ $180^0 = 180^0$ $n = 6$ The polygon is hexagon.	B_1 B_1 B_1	For the equation For 6 sides For naming the polygon	Make a review on interior and exterior angles.
		b) i) $n - 2$ $6 - 2$ $= 4$ triangles	B_1	For the answer	
		ii) $2(n - 2)$ $2(6 - 2)$ 2×4 8 right angles	B_1	For the answer	
24.	P.7	a) Above 12yrs | reminder | 11years | below 11yrs 50% | 100% - 50% = 50% | 20% of 50% = $\frac{20}{100} \times 50\%$ = 10% | 50-10% = 40% 40% of children below 11years.	B_1 B_1 B_1	For 50% For 10% For 40%	Follow through candidate's work. Accept any other method leading to correct answer.

		(b) 40% rep 12 pupils 1% rep $\frac{12}{40}$ 100% rep $\frac{12}{40} \times 100$ $= \frac{\cancel{12}^{3}}{\cancel{40}_{1}} \times 100$ $= 30$ pupils	M_1 A_1	For the method For the answer	
25	P.7	a) $(25 + 2k + k - 2) - (15 + k + k) = 13$ $25 + 3k - 2 - 15 - 2k = 13$ $25 - 2 - 15 + 3k - 2k = 13$ $23 - 15 + k = 13$ $8 + k = 13$ $8 - 8 + k = 13 - 8$ $k = 5$	B_1 B_1 B_1	For the equation For the method For 5	Make a review on algebra basing on collecting like terms.
		(b) $15 + k + k + 25 + 2k$ $15 + 25 + k + k + 2k$ $40 + 4k$ $40 + (4 \times 5)$ $40 + 20$ 60 $n(MUE) = 60$	B_1 B_1	For the method For n(MUE)	
		c) Probability $= \frac{n(E)}{n(s\text{-}s)}$ $n(E) = 15 + 5 + 5$ $= 25$ $n(s\text{-}s) = 60$ Probability $= \frac{25}{60}$	B_1	For the answer	
26	P7	Let the son's age be w. Wasswa: now $4w$, In 6yrs $4w + 6$ son: now w, In 6yrs $w + 6$ total: 30 $4w + 6 - w + 6 = 30$ $4w - w + 6 + 6 = 30$ $32 + 12 = 30$ $3w + 12 - 12 = 30 - 12$ $3w = 18$ $\frac{\cancel{3}w}{\cancel{3}} = \frac{\cancel{18}^{6}}{\cancel{3}}$ $W = 6$ Wasswa $= 4w$ $= 4 \times 6$ $= 24$ years	 B_1 B_1 B_1	 For the equation. For 6 sides For 24 years	Make enough practice on related questions
		b) $(6 - 3)$ years 3 years	B_2	For the answer	
27	P.6	a) Paul = 20 seconds Mercy = 12 seconds	B_1 B_1	For each correct answer	Encourage candidates to identify the scale before answering the questions
		b) Paul was at point E	B_1		
		c) covered 5cm	B_1		
28	P.3	Magic sum $= 7 + 8 + 3$ $= 18$	B_1	For 18	Accept any other method leading to correct answer.

		<table><tr><td>9</td><td>t=2</td><td>7</td></tr><tr><td>4</td><td>k=6</td><td>8</td></tr><tr><td>n=5</td><td>10</td><td>3</td></tr></table> k = 18 – (4 + 8) = 18 – 12 = 6 n = 18 – (4 + 9) = 18 – 13 = 5 t = 18 – (9 + 7) = 18 – 16 = 2	B1 B1 B1	For 6 For 5 For 2	
29	P.7	a) 1US $ = Ug sh 3690 300 US $ = Ug sh 3690 x 300 Ug sh 1,107,000	M1 A1	For the method. For the answer	Make a review on exchange rate on tables
		b) 1ksh = Ug sh 25 18000 Ksh = Ugsh 25 x 18000 Ugsh 450,000 ~~Ugsh 450,000~~ ~~Ug sh~~ 3750 (45000) US dollars 375 120 US dollars	M1 A1 M1 A1	For the method. For the answer For the method. For the answer	
30	P.7	Area of article Area = πr^2 = $\frac{22}{7^1} \times 14^2$cm x 14cm = 22 x 2cm 14cm = 44cm x 14cm = 616cm^2 Area of parallelogram = 1 of circle 4 = 1 x 616cm^2 4 = 154cm^2 154cm^2 = b x h 154cm^2 = 14cm x h 154cm^2 = ~~14cm~~h 14cm ~~14cm~~ 11cm = h Height = 11cm	B1 B1 B1 B1	For 616cm^2 154cm^2 For the method For 11cm	Encourage candidates to find area and perimeter of plane shapes.
31	P.5	a) H T | 0 3 4 | 7 3 4 0 + 1 0 3 5 0	M1 A1	For the method For the answer	Make a review on rounding off both on whole numbers and decimal numbers.
		<table><tr><td>x10^3</td><td>x10^2</td><td>x10^1</td><td>x10^0</td></tr><tr><td>4</td><td>2</td><td>1</td><td>9</td></tr></table> (b) (4 x 10^3) + (2 x 10^2) + (1 x 10^1) + (9 x 10^0)	B2	For the answer	

32	10km = 1cm 1km = $\frac{1}{10}$ 60km = $\frac{1}{10}$ x 60cm = 6cm 10km = 1cm 1km = $\frac{1}{10}$ 50km = $\frac{1}{10}$ x 50cm = 5cm Sketch  Accurate Daigram  	S1 L1 L1 C1	For the sketch For 6cm For 5cm For 200°	Make a review on rounding off both on while numbers and decimal numbers
b)	Line QR = +6.5CM 1km = (6.5 x 10)km = 65km	L1	For $\overline{QR}$	