Name: _____ ( )	Class: _____

SERVE·LEAD·EXCEL

GREENDALE SECONDARY SCHOOL
End-of-Year Examination 2014

MATHEMATICS

Paper 1 — 13 Oct 2014

Secondary One Normal Academic — **1 hour**

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in.
Write in dark or blue pen.
You may use a soft pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working may result in loss of marks.
You are expected to use a scientific calculator to evaluate explicit numerical expressions.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures.
Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142, unless the question required the answer in terms of π.

At the end of the examination, fasten all your work securely together,
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 40.

For Examiner's Use Only

Question Number	Marks Obtained
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
Total Marks	

This document consists of 9 printed pages.

Answer all questions.

1. (a) Express 40% as a fraction in its lowest terms.

Ans: (a) _____ [1]

(b) Express $\frac{1}{75}$ as a decimal.

Ans: (b)_____ [1]

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2. By writing each number correct to 1 significant figure, **estimate** the value of

$$\frac{49.3 \times 0.45}{10.3}.$$

You must show your working.

Ans: _____ [2]

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3. Convert 72 km/h to m/s.

Ans: _____ m/s [2]

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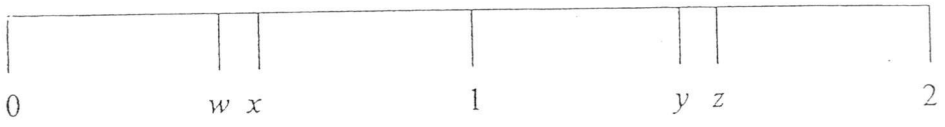
4. The numbers w, x, y and z are represented on the number line.



The values of w, x, y and z are listed below.

$\frac{8}{5}$ 0.6 $\frac{5}{8}$ $\frac{\pi}{2}$

Find w, x, y and z.

Ans: w = _____

Ans: x = _____

Ans: y = _____

Ans: z = _____ [2]

---

5. The ratio of boys to girls in a group of children was 5 : 3. The total number of children in the group was 56.

(a) How many boys were there?

Ans: (a) _____ boys [1]

(b) When some more boys joined the group, the ratio of boys to girls became 20 : 7. How many boys joined the group?

Ans: (b) _____ boys [2]

6. A plane travelled from Changi Airport, Singapore to Rome Airport, Italy. The flight took 12 hours 55 minutes.
When the local time in Changi is 8.00 am, the local time in Rome is 2.00 am.

(a) The plane left Changi at 8.45 am local time.
What was the local time in Rome when it arrived?

Ans: (a) _____ [2]

(b) The plane travelled a total distance of 10075 km.
Find the average speed, in kilometres per hour, of the plane.

Ans: (b) _____ km/h [2]

---

7. (a) Express 5400 as a product of its prime factors, giving your answer in index notation.

Ans: (a) _____ [2]

(b) Hence, find the smallest positive integer m such that 5400 m is a perfect square.

Ans: (b) _____ [1]

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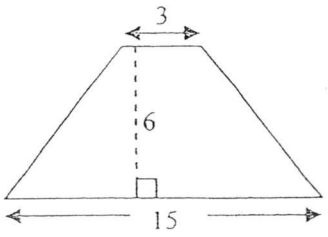
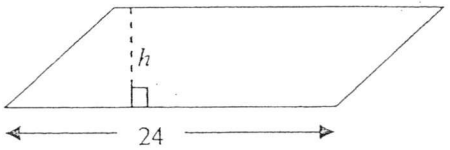
8. The area of the parallelogram is the same as the area of the trapezium.

All lengths are measured in centimetres.





Calculate the height, h, of the parallelogram.

Ans: h = _____ cm [3]

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9. x slices of cake cost \$6. The cost of 3 cups of coffee is \$$y$.

Express the price of two slices of cakes and one cup of coffee in terms of x and y.

Ans: \$ _____ [2]

---

10. **(a)** Given that $a=-3$, $b=2$ and $c=\frac{1}{2}$. Find the value of $\frac{a^2-b}{c}$.

Ans: (a) _____ [2]

(b) Simplify $5x-3y+7y-2x+3$.

Ans: (b) _____ [2]

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11. Solve

(a) $4x-13=8$,

Ans: (a) _____ [1]

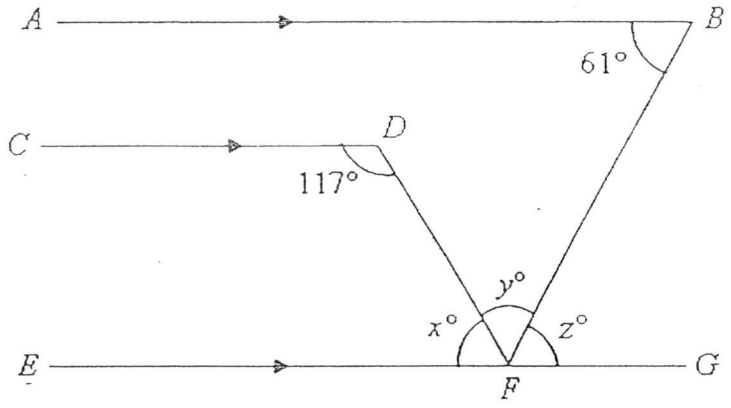
(b) $5(x+2)-3=6x+15$.

Ans: (b) _____ [2]

---

12. In the diagram below, AB, CD and EFG are parallel.

It is given that $\angle ABF = 61°$ and $\angle CDF = 117°$.



By stating your reasons clearly, find the value of

(a) angle x,

Ans: (a) _____ ° Reason: (_____) [1]

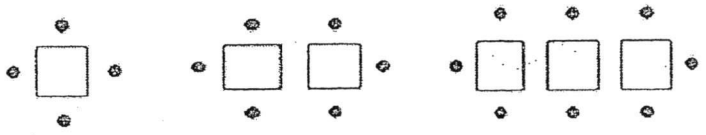
(b) angle z,

Ans: (b) _____ ° Reason: (_____) [1]

(c) angle y.

Ans: (c) _____ ° Reason: (_____) [1]

13. The arrangements of tables (☐) and chairs (•) in a café start a sequence.



Arrangement 1 **Arrangement 2** **Arrangement 3**

This sequence is continued.

(a) How many chairs will there be in Arrangement 5?

Ans: (a) _____ [1]

(b) Write down an expression, in terms of n, for the number of chairs in Arrangement n.

Ans: (b) _____ [2]

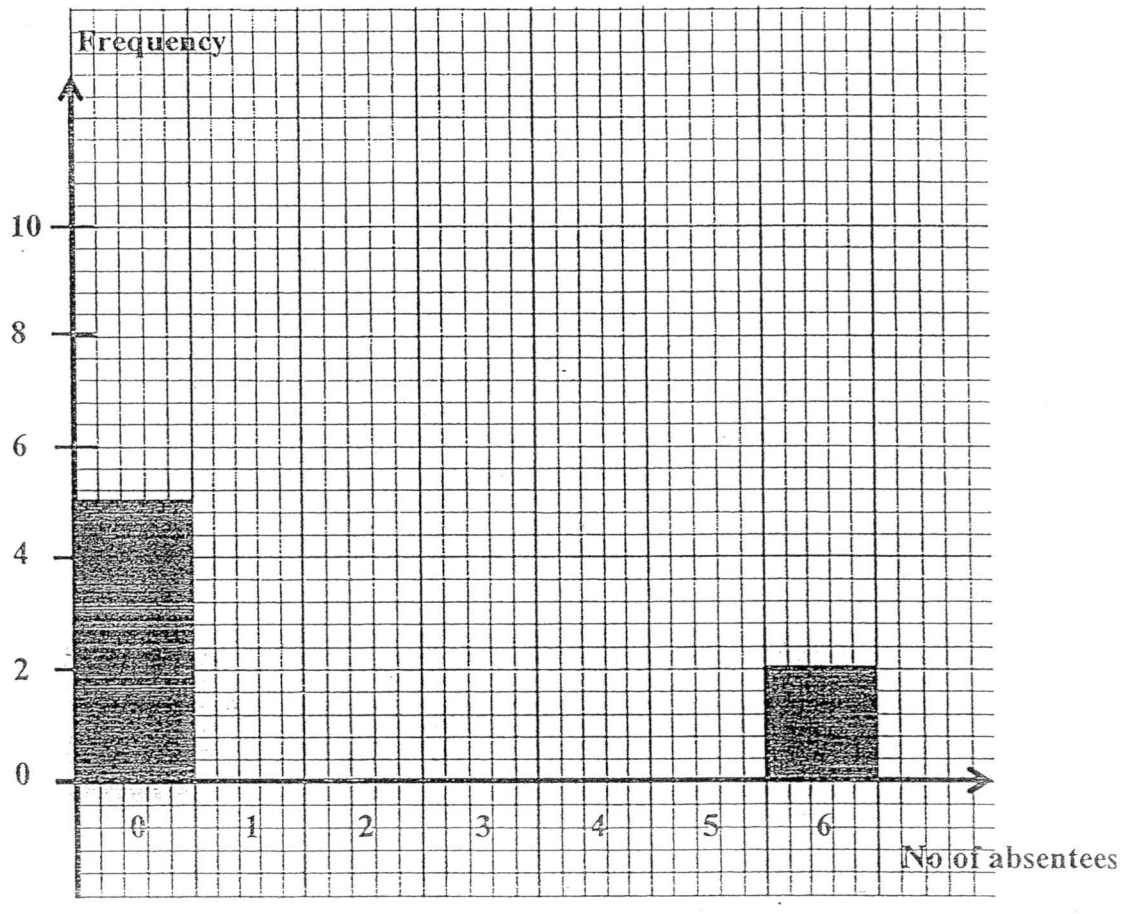
14. The following data shows the number of times each student has been absent in a class of 40 for the whole year.

2	3	4	0	1	5	3	2	2	1
5	6	0	1	2	2	3	1	4	1
4	2	3	0	0	1	2	3	1	0
2	2	2	4	1	3	6	5	4	3

(a) Complete the following frequency table for the number of absentees in the class for the year. [2]

Number of absentees for the year	Tally	Frequency
0	///	5
1		
2		
3		
4		
5		
6	//	2

(b) Hence complete the histogram. [2]



End of Paper

Name:_____ ( )	Class:_____

SERVE·LEAD·EXCEL

GREENDALE SECONDARY SCHOOL
End-of-Year Examination 2014

MATHEMATICS

Paper 2 — 07 Oct 2014

Secondary One Normal Academic — **1 hour 30 minutes**

Candidates answer on the writing papers provided.

READ THESE INSTRUCTIONS FIRST
Write your index number and name on all the work you hand in.
Write in dark or blue pen.
You may use a soft pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

If working is needed for any question it must be shown with the answer.

Omission of essential working may result in loss of marks.

You are expected to use a scientific calculator to evaluate explicit numerical expressions.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π, use either your calculator value or 3.142, unless the question required the answer in terms of π.

At the end of the examination, fasten all your work securely together,
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is **45**.

This document consists of 6 printed pages.

Answer **all** questions

1. Find

   (a) the highest common factor (HCF) of 360 and 756, [1]

   (b) the lowest common multiple (LCM) of 360 and 756. [2]

---

2. A bus traveled 45 km at 60 km/h.
   It then slowed down and travelled at 30 km/h for another 1.5 hours.
   Calculate the

   (a) time taken for the first part of the journey, [1]

   (b) distance travelled in the second part of the journey, [1]

   (c) average speed for the whole journey. [2]

---

3. **(a)** The number of tourists in Singapore was 11.6 million in 2010.
   Given that the percentage increase for the number of tourists from 2010 to 2011 was 15%, calculate the number of tourists in 2011, giving your answer correct to the nearest million. [2]

   (b) If the average length of stay for tourists in Singapore dropped from 3.8 days to 3.7 days, find the percentage decrease. Give your answer correct to two significant figures. [2]

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4. (a) Mr Chen bought a watch for $112.35.
The price included 7% Goods and Service Tax (G.S.T.).
How much GST did Mr Chen pay? [2]

(b) After a year, Mr Chen sold the watch at a 60% discount.
How much did he sold the watch for?
Give your answer to the nearest ten cent. [2]

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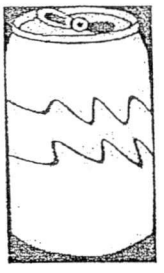
5. A convenient store is having a sale on two different types of beverages as shown below.

Lightning Soda
$0.70 each
Buy 4 get 1 FREE



Ice-cream Soda
~~$0.80~~ each
$0.65 each NOW

(a) Siti wants to buy 12 soda cans of the same type, with the lowest price.
Which soda offer should she choose? Show all essential working clearly. [2]

(b) Joan buys 24 Lightning soda and 16 Ice-cream soda cans.
She wants to pack them into as many gift packs as possible.
Each gift pack has the same number of Lightning and Ice-cream soda cans.

(i) What is the greatest number of gift packs that can be made? [2]

(ii) How many Lightning and Ice-cream soda cans will there be in each gift pack? [1]

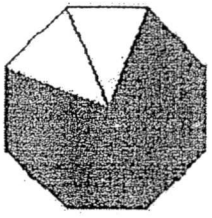
---

6. **(a)** Express 50 cm as a fraction of 20 m in its simplest form. [2]

(b) Which of these **two** ratios are equivalent to the ratio $a : b$? [2]

$a^2 : b^2$ $\quad$ $3a : 3b$ $\quad$ $\frac{1}{b} : \frac{1}{a}$ $\quad$ $a+1 : b+1$

(c) The shape below is made up of 8 identical triangles. Express the unshaded portion as a percentage of the shaded portion. [1]



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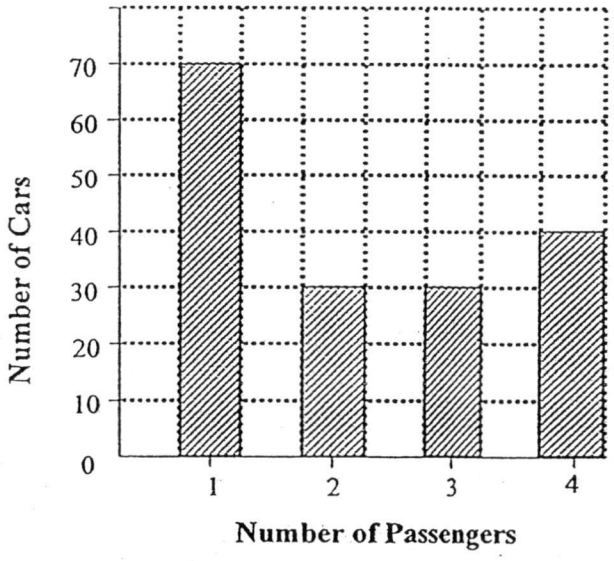
7. The bar graph below shows the number of passengers in each car driving into Mega Shopping Mall in a particular morning.



(a) Calculate the total number of cars. [1]

(b) Calculate the total number of passengers in those cars. [2]

(c) If the number of cars is to be represented in a pie chart, find the angle of the sector representing cars with 4 passengers. [2]

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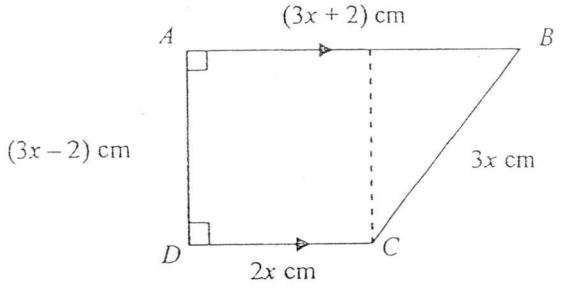
8. **(a)** Simplify $5x - 2(x + y)$. [2]

(b) The figure below shows a trapezium $ABCD$.



(i) Show that the perimeter of the trapezium is $11x$ cm. [2]

(ii) Find the value of x given that the perimeter is 33 cm. [2]

(iii) Using your answer in part **(ii)**, find the area of the trapezium. [2]

9. **Diagram I** shows a solid metal triangular prism.

The cross-section of the prism is a right-angled triangle ABC.

$AB = 9$ cm, $BC = 12$ cm, $EF = 15$ cm and $AE = 23$ cm.

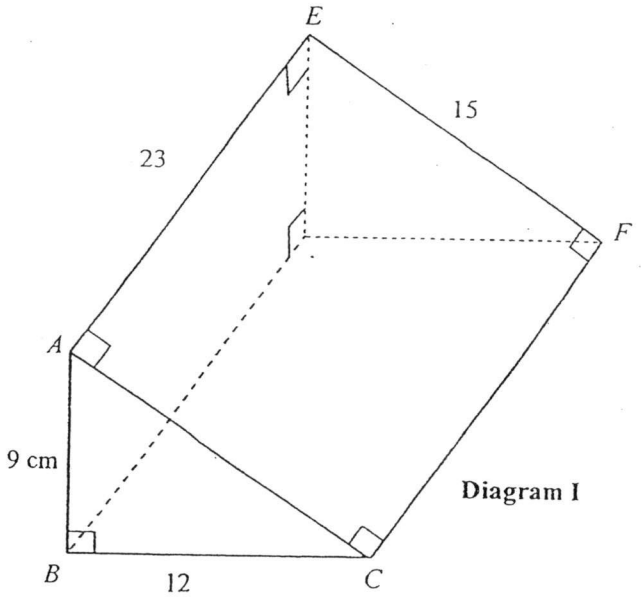


Diagram I

(a) Find

(i) the area of the cross-section ABC, [1]

(ii) the volume of the prism, [1]

(iii) the total surface area of the prism. [2]

(b) The solid in **Diagram I** was melted down and the metal was used to produce solid cylinders with radius 2.5 cm and height 6 cm as shown in **Diagram II**.

Calculate the number of cylinders that can be produced. [3]

[Take $\pi = 3.142$]

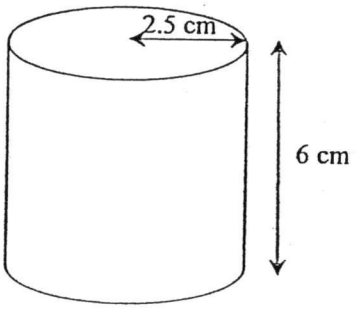


Diagram II

End of Paper

2014 SEC 1NA P1 EOY MARKING SCHEME

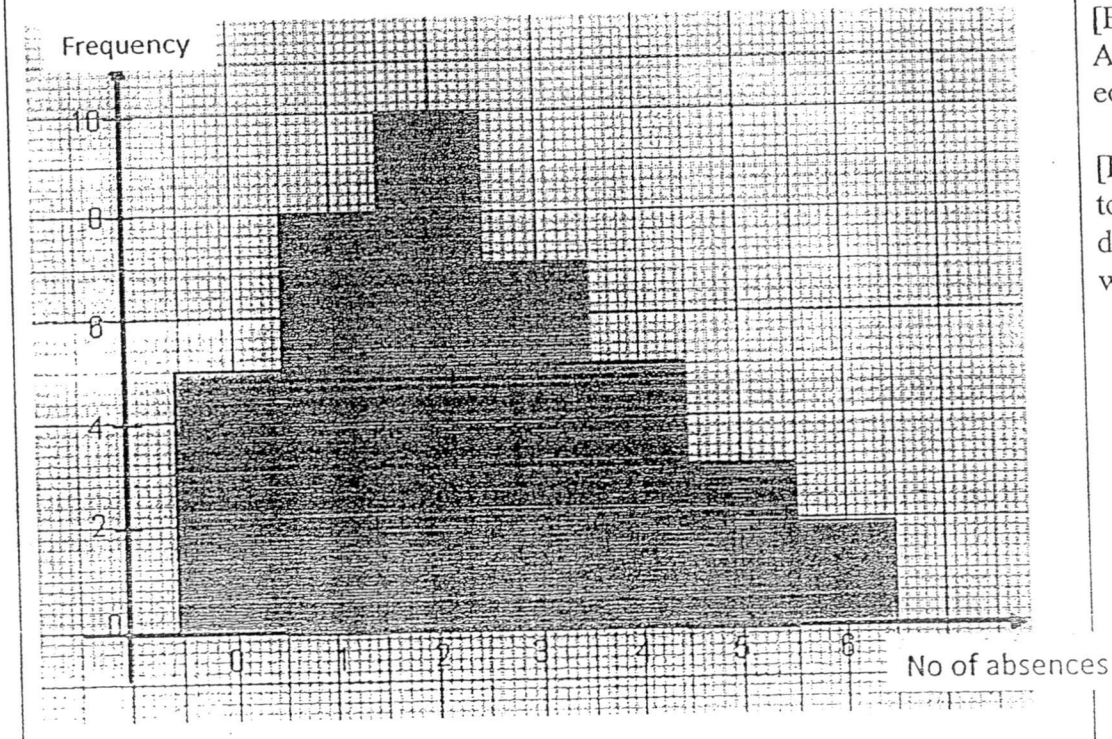
1a	$\frac{2}{5}$	[B1]
1b	$0.01\dot{3}$ or 0.0133 (min 3s.f)	[B1]
2	$= \frac{50 \times 0.5}{10}$ $= 2.5$	[M1] [A1]
3	$\frac{72km}{1h} = \frac{72000m}{3600s}$ $= 20$ m/s	[M1] [A1]
4a	$w = 0.6$ $x = \frac{5}{8}$ $y = \frac{\pi}{2}$ $z = \frac{8}{5}$ [0 – all wrong or only 1 correct ans]	[B2 – all correct] [B1 – max 2 wrong]
5a	35 boys	[B1]
5b	20 : 7 $= 60 : 21$ $\therefore$ 60 – 35 = 25 boys joined the group	[M1] [A1]
6a	08 45 + 12 hours 55 mins = 2140 Rome is 6 hour behind Singapore. $\therefore$ 2140 – 0600 = 1540 or 3.40 pm	[M1] [A1]
6b	Average speed $= \frac{10075km}{12\frac{55}{60}h}$ $= 780$ km/h	[M1] [A1]

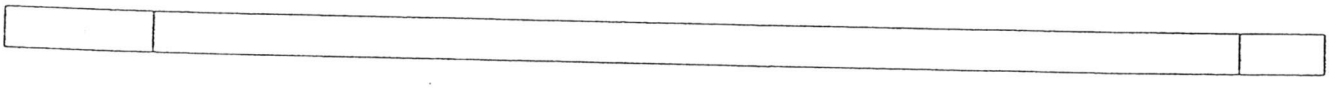
7a	2 | 5400 2 | 2700 2 | 1350 3 | 675 3 | 225 3 | 75 5 | 25 5 | 5 1	[M1]
	$5400 = 2^3 \times 3^3 \times 5^2$	[A1]
7b	6	[B1]
8	Area of trapezium $\frac{1}{2}(15+3)(6) = 54$	[M1]
	$\frac{1}{2}(3+15)6 = 24h$	[M1]
	$54 = 24h$ $h = 2.25$ cm	[A1]
9	1 slice of cake cost $\$\left(\frac{6}{x}\right)$ 1 cup of coffee cost $\$\left(\frac{y}{3}\right)$	[M1]
	2 slices of cakes and 1 cup of coffee cost $\$\left(\frac{12}{x}+\frac{y}{3}\right)$	[A1]
10a	$=\frac{(-3)^2-2}{\left(\frac{1}{2}\right)}$	[M1]
	$= 14$	[A1]
10b	$5x-3y+7y-2x+3$ $=5x-2x-3y+7y+3$ $=3x+4y+3$	[M1] [A1] or [B2]
11a	$4x-13=8$ $x=5.25$ *or* $5\frac{1}{4}$ *or* $\frac{21}{4}$	[B1]

11b	$5(x+2)-3=6x+15$ $5x+10-3=6x+15$ $x=-8$	[M1] [A1]
12a	$\underline{63}^\circ$ Reason: (Int. angle)	[B1]
12b	$\underline{61}^\circ$ Reason: (Alternate angle)	[B1]
12c	$\underline{56}^\circ$ Reason: (Angle on a St. line)	[B1]
13a	12	[B1]
13b	$2n+2$	[B2]
14a		[B2] [B1- 1 to 2 errors]
14b		[B2] Allow ecf [B1-up to 2 bars drawn wrongly]

*Deduct 1m for overall qn
1) no reasons given
2) incorrect reasons given
3) not all 3 reasons given/correct

Number of absences for the year	Tally	Frequency
0	𝍸	5
1	𝍸 ///	8
2	𝍸 𝍸	10
3	𝍸 //	7
4	𝍸	5
5	///	3
6	//	2





2014 SEC 1NA P2 EOY MARKING SCHEME

1a	HCF = 36	[B1]
1b	2 | 360 | 756 2 | 180 | 378 3 | 90 | 189 3 | 30 | 63 10 | 21 LCM = $36\times10\times21 = 7560$	[M1] [A1]
2a	Time taken $= \frac{45\ km}{60\ km/h} = 0.75h$ *or* 45 mins	[B1]
2b	Distance travelled $= 30\times1.5 = 45$ km	[B1]
2c	Average speed $= \frac{45+45}{0.75+1.5}$ $= 40$ km/h	[M1] [A1]
3a	115 % of 11.6 million $= \frac{115}{100}\times11.6$ million $= 13.34$ million ≈ 13 million	[M1] [A1]
3b	% decrease $= \frac{3.8-3.7}{3.8}\times100\%$ $= 2.6$ % (2 s.f)	[M1] [A1]
4a	107% ------- \$112.35 7% --------- $= \frac{112.35}{107}\times7$ =\$7.35	[M1] [A1]
4b	$100\% - 60\% = 40\%$ Selling Price $= \frac{40}{100}\times112.35$ \$44.90 (nearest ten cent)	[M1] [A1]

5a	<table><tr><td>Cost of buying 12 Lightning Sodas</td><td>Cost of buying 12 Ice-cream Sodas</td></tr><tr><td>Buy 8, free 2 + 2 more cans at \$0.70 Total cost = $8\times0.70+1.40$ = \$7</td><td>Total cost = 12×0.65 = \$ 7.80</td></tr></table> She should choose the Lightning Soda.	[M1] [A1]
5bi	Using HCF: <table><tr><td>2</td><td>24</td><td>16</td></tr><tr><td>2</td><td>12</td><td>8</td></tr><tr><td>2</td><td>6</td><td>4</td></tr><tr><td></td><td>3</td><td>2</td></tr></table> = 8 gift packs	[M1] [A1]
5bii	3 Lightning Soda 2 Ice-cream Soda	[B1]
6a	20 m = 2000cm $\frac{50}{2000}=\frac{1}{40}$	[M1] [A1]
6b	$3a:3b$ and $\frac{1}{b}:\frac{1}{a}$	[B1] [B1]
6c	$\frac{2}{6}\times100\%=33\frac{1}{3}\%$	[B1]
7a	170 cars	[B1]
7b	$(70\times1)+(30\times2)+(30\times3)+(40\times4)$ $=380$	[M1] [A1]
7c	$\frac{40}{170}\times360^\circ$ $= 85^\circ$ (2s.f.) or 84.7 (1 d.p)	[M1] [A1]

8a	$5x-2(x+y)=5x-2x-2y$ $=3x-2y$	[M1] [A1]
8bi	Perimeter $=3x+2+3x+2x+3x-2$ $=11x$ cm (Shown)	[M1] [A1]
8bii	$11x=33$ $x=3$	[M1] [A1]
8biii	Area of trapezium $=\frac{1}{2}[2(3)+[3(3)+2][3(3)-2]$ $=59.5\ \text{cm}^2$	[M1] [A1]
9ai	$54\ \text{cm}^2$	[B1]
9aii	$1242\ \text{cm}^3$	[B1]
9aiii	Total Surface Area $=(12+9+15)(23)+2(54)$ $=936\ \text{cm}^2$	[M1] [A1]
9b	Volume of cylinder $=(3.142)(2.5)^2(6)=117.825$ Number of cylinders that can be produced $=\frac{1242}{117.825}$ $=10.541$ ≈ 10 cylinders	[M1] [M1] e.c.f (ii) [A1]