



**REGENT SECONDARY SCHOOL
END OF YEAR EXAMINATION (SA2) 2017
SECONDARY ONE (EXPRESS)**

NAME: _____
CLASS: _____

INDEX NUMBER: _____
SETTER : Ms Jacintha

MATHEMATICS

4048/01
9th October 2017

Paper 1

1 hour 15 mins

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a 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 will result in loss of marks.

The use of an approved scientific calculator is expected, where appropriate.

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 your answers in degrees to one decimal place.

For π , use either your calculator value or 3.142, unless the question requires 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 of the marks for this paper is 50.

50	TARGET
PARENT'S SIGNATURE	

This document consists of **10** printed pages.

Answer **all** questions.**1** Express**(a)** 33% as a fraction in its lowest terms,*Answer (a)*..... [1]**(b)** $15\frac{1}{4}$ as a percentage.*Answer (b)*..... [1]**2** By rounding off each term to 1 significant figure, estimate the value of $\frac{56.89 - \sqrt{104.2}}{\sqrt[3]{61.76 + 3.99}}$.*Answer* [2]**3** Consider the following numbers,

$$\sqrt[3]{125}, 0.\dot{5}1\dot{6}, 8, -\frac{49}{7}, \pi$$

Write down all the

(a) irrational number(s).*Answer (a)*..... [1]**(b)** integer(s).*Answer (b)*..... [1]**(c)** perfect cube(s).*Answer (c)*..... [1]

For
Examiner's
Use

For
Examiner's
Use

- 4 (a) Write a simplified algebraic expression for the statement “ Cube root of the product of w and x .’

Answer (a) [1]

- (b) Express $\frac{b-5}{3} - \frac{2b-3}{5}$ as a single fraction.

Answer (b) [3]

- 5 A sum of money was divided between Amy and Daniel in the ratio 5 : 12. After Amy spent \$22, the ratio became 3 : 16. Find the amount of money Amy had at first.

Answer \$..... [3]

6 The number 1888 can be expressed as $2^a \times b$, where a and b are integers.

(a) Find the value of a and of b .

Answer (a) $a = \dots\dots\dots$ [1]

$b = \dots\dots\dots$ [1]

(b) Given that $x = 2^3 \times 5 \times 7$, evaluate the highest common factor of 1888 and x .

Answer (b) $\dots\dots\dots$ [1]

(c) Find the smallest integer n such that $1888n$ is a perfect square.

Answer (c) $n = \dots\dots\dots$ [1]

For
Examiner's
Use

For
Examiner's
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For
Examiner's
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For
Examiner's
Use

7 A man ran 2.4 km in 16 minutes. He then walked a further 900 m at an average speed of 4 km/h. Calculate

(a) his speed, in km/h, in the first 16 minutes,

Answer (a).....km/h [2]

(b) the time, in minutes, he took to walk,

Answer (b).....minutes [2]

(c) his average speed, in m/s, for the whole distance travelled.

Answer (c).....m/s [2]

8 If $a = 2\frac{1}{4}$ and $b = 0.75$, find the ratio of $a : b$.

Answer [2]

For
Examiner's
Use

9 (a) Factorise completely

(i) $-6c^2 - 4cd$

Answer (a)(i) [1]

(ii) $4pq + 2p^2 - 10p$

Answer (a)(ii) [2]

(b) Expand and simplify $3 - (2x^2 + 4)$.

Answer (b)..... [2]

For
Examiner's
Use

For
Examiner's
Use

For
Examiner's
Use

10 Solve the following equations.

(a) $x + 3 = 2x + 1$.

Answer $x = \dots\dots\dots$ [2]

(b) $\frac{2}{x} = \frac{3}{x+2}$.

Answer $x = \dots\dots\dots$ [2]

(c) $2 - \frac{x-9}{3} = -3$.

Answer $x = \dots\dots\dots$ [3]

For
Examiner's
Use

For
Examiner's
Use

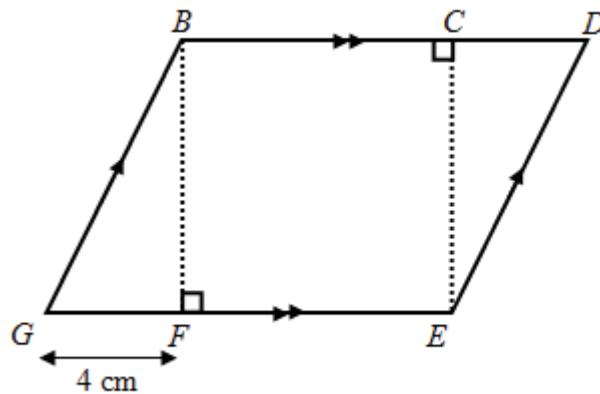
- 11 (a) Solve $-3q > 6$ and illustrate the solution on a number line in the space given below.

Answer (a) [2]

- (b) Find the smallest integer value q that satisfies the inequality $4q - 1 > 6$.

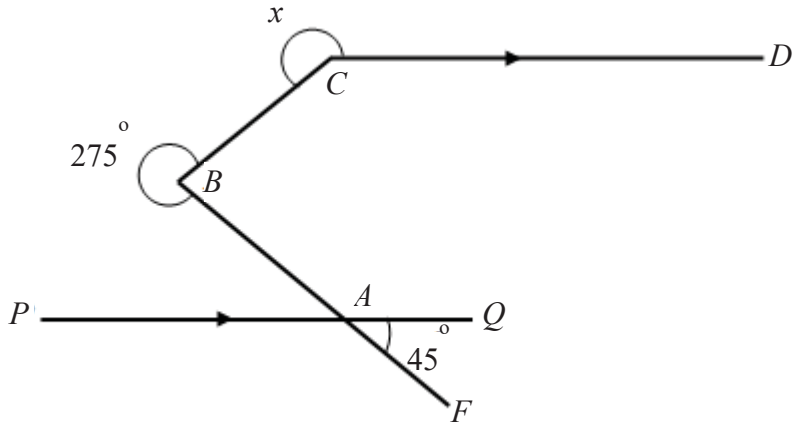
Answer (b) [2]

- 12 In the diagram below, $BCEF$ is a square with an area of 36 cm^2 and $GF = 4 \text{ cm}$. Calculate the area of parallelogram $BDEG$.



Answer cm^2 [2]

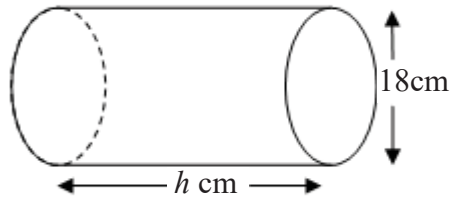
- 13** Find the value of x in the figure below, showing your working clearly. State the properties and angles where possible.



Answer [3]

For
Examiner's
Use

- 14** In the **closed** cylinder below, the diameter of the cross-section is 18 cm. Given that its total surface area is $702\pi \text{ cm}^2$, calculate the height, h , of the cylinder.

For
Examiner's
UseAnswer $h =$ [3]*Have you checked your work?***END OF PAPER**



**REGENT SECONDARY SCHOOL
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SECONDARY ONE (EXPRESS)**

NAME: _____
CLASS: _____

INDEX NUMBER: _____
SETTER: Ms Jacintha

MATHEMATICS

Paper 2

4048/02

10th October 2017

1 hour 30 minutes

Additional Materials: Answer Paper

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a 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 will result in loss of marks.

The use of an approved scientific calculator is expected, where appropriate.

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 your answers in degrees to one decimal place.

For π , use either your calculator value or 3.142, unless the question requires 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 of the marks for this paper is 50.

50	TARGET
PARENT'S SIGNATURE	

This document consists of **6** printed pages.

Answer **all** questions.

1 (a) Find the sum of interior angles of a 12-sided polygon. [2]

(b) A polygon has 15 sides. Three of its exterior angles are 45° , 46° and 29° while the twelve remaining exterior angles of the polygon are x° each. Find the value of x . [2]

2 The population of Brunei was 422 000 in 2016. This value has been rounded off to the nearest 1000.

(a) What is the largest possible value of the population of Brunei in 2016 ? [1]

(b) What is the smallest possible value of the population of Brunei in 2016 ? [1]

3 (a) The price of a computer increases from \$1300 to \$1420. Find the percentage increase in its price. [2]

(b) The marked price of a paint art is \$6750. There is a discount of 5% for members.

(i) Find the selling price for a member after the discount. [1]

(ii) Given that there is a GST of 7%, find the total amount payable by the member, leaving your answer in the nearest cents. [2]

4 (a) Simplify the following expression.

$$\frac{2p+5}{7} + \frac{3q-1}{4} \quad [2]$$

(b) Expand and simplify the following expression.

$$5(4a+5b) - 3(2a-7b) \quad [2]$$

(c) Factorise the following expression completely.

$$18gh + 9g - 27gk \quad [2]$$

5 A pattern was created using toothpicks. The first three figures are shown below.



Figure 1



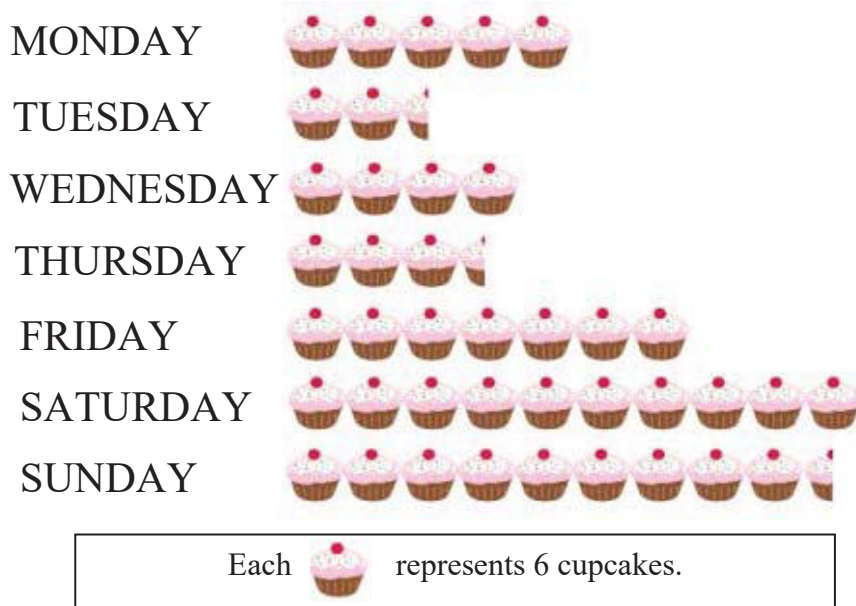
Figure 2



Figure 3

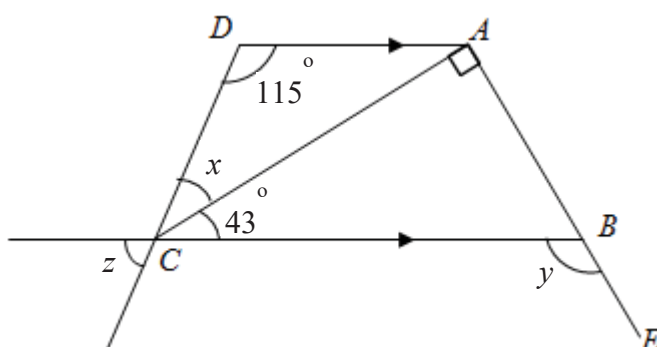
- (a) How many toothpicks are used in Figure 5? [1]
- (b) Write down an expression, in terms of n , for the number of toothpicks in Figure n . [1]
- (c) Calculate the number of toothpicks in Figure 250. [1]

6 The following pictogram illustrates the number of cupcakes sold in a bakery in a particular week.



- (a) How many more cupcakes were sold on Monday as compared to Tuesday? [1]
- (b) If each cupcake was sold at \$3.50, calculate the total sales amount from the cupcakes sold in that week. [2]
- (c) Express the ratio of cupcakes sold on weekends to that sold on weekdays. [1]

- 7 The diagram below shows trapezium $ABCD$ where AD is parallel to BC . ABE is a straight line, $\angle CAB = 90^\circ$, $\angle ADC = 115^\circ$ and $\angle ACB = 43^\circ$.



Stating the reasons clearly, find

(a) x , [2]

(b) y , [2]

(c) z . [1]

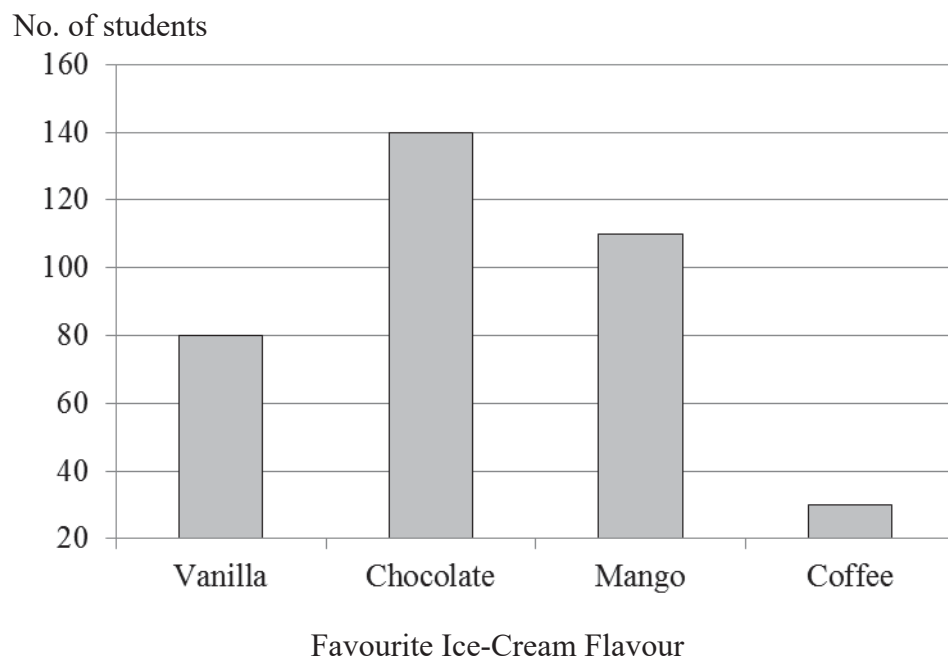
8 (a) Draw and label $\triangle ABC$ such that $\angle BAC = 48^\circ$, $AB = 7.9$ cm and $AC = 4.8$ cm. [3]

(b) Construct the perpendicular bisector of AB . [1]

(c) Construct the bisector of $\angle ABC$. [1]

(d) Label the intersection point of the perpendicular bisector of AB and the angle bisector of $\angle ABC$ as M . Measure the distance M from A . [2]

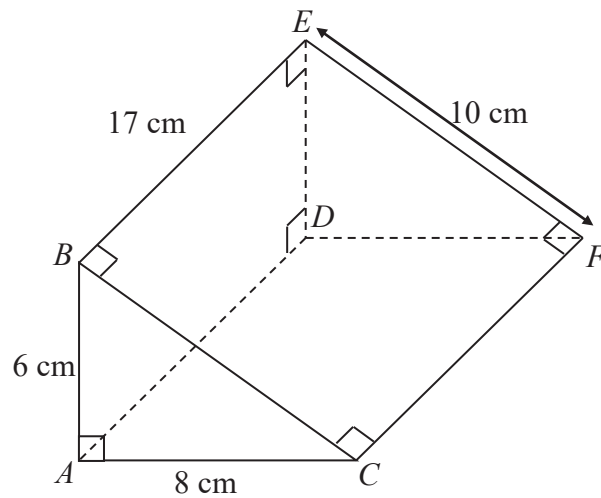
- 9 The bar graph below shows the survey result of a group of Secondary One Students from Santa Secondary School on their preference of ice-cream flavour.



- (a) How many more students prefer Mango flavour to Coffee flavour? [1]
- (b) What fraction of the students chose Chocolate flavour as their favourite? [2]
- (c) What percentage of the students did not choose Vanilla as their favourite flavour? [2]
- (d) Jamie observed the bar graph and claimed that the number of students who prefer Chocolate flavour is twice the number of students who prefer Vanilla flavour. State one way in which the bar graph is misleading Jamie. [2]

- 10** The diagram below shows a solid prism. The prism has a cross-section of a right-angled triangle.

$AB = 6$ cm, $AC = 8$ cm, $EF = 10$ cm and $BE = 17$ cm.



Calculate,

- (a) the area of the cross-section ABC , [1]
- (b) the volume of the prism, [1]
- (c) the total surface area of the prism. [2]
- (d) A cylindrical container with radius 10 cm is filled with some water. Ten such solid prisms were dropped into the container, causing the water level to rise. Assuming that there is no water flowing out of the container, calculate the increase in the water level in the container. [3]

Have you checked your work?
END OF PAPER

Answer x =

(e) $2 - \frac{x-9}{3} = -3$

[1]

Answer x =

[2]

[3]

For Examiner's Use **10** (a) Solve $-3q > 6$ and illustrate the solution on a number line in the space given below.

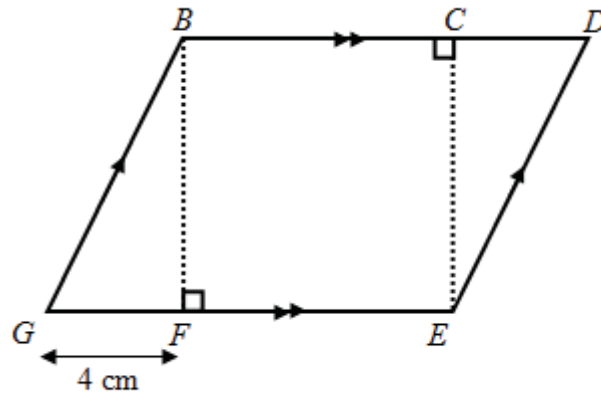
For Examiner's Use

Answer (a) [2]

(b) Find the smallest integer value q that satisfies the inequality $4q - 1 > 6$.

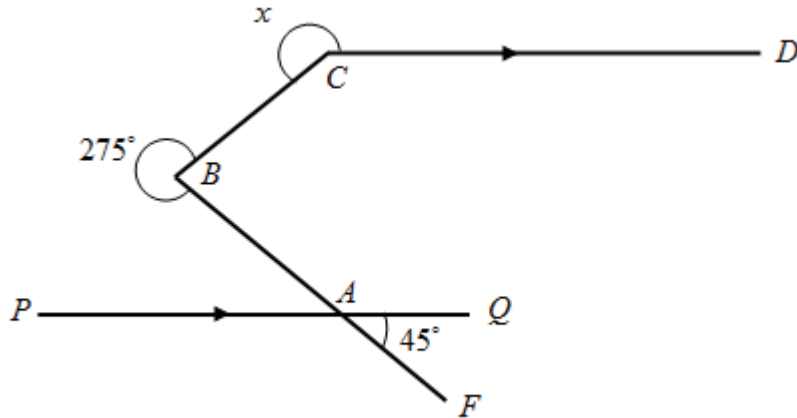
Answer (b) [2]

- 11 In the diagram below, $BCEF$ is a square with an area of 36 cm^2 . What is the area of parallelogram $BDEG$?



Answer cm^2 [2]

- 12 Find the value of x in the figure below.

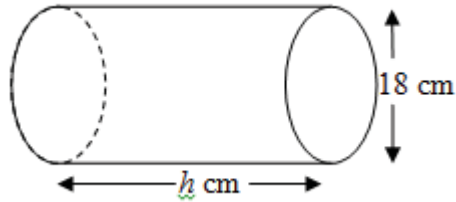


Answer [3]

For
Examiner's
Use

- 13** In the cylinder below, the diameter of the cross-section is 18 cm. Given that its total surface area is $702\pi \text{ cm}^2$, calculate the height, h , of the cylinder.

For
Examiner's
Use



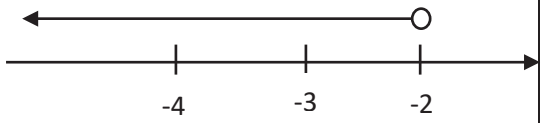
Answer [3]

Have you checked your work?
END OF PAPER

1E EOY PAPER 1 2017 MARKING SCHEME

Qn	Working	Marks	Marker's report
1a	$\frac{33}{100}$	B1	Well done
1b	1525%	B1	Many students put 15.25% instead.
2	$\frac{60 - \sqrt{100}}{\sqrt[3]{60+4}} = \frac{50}{4}$ = 12.5	M1 A1	Common mistake : Students did not estimate and only rounded off the final answer to 1sf.
3a	π	B1	Badly done. Students
3b	$\sqrt[3]{125, 8, -\frac{49}{7}}$	B1	
3c	8	B1	
4a	$\sqrt[3]{wx}$		
4b	$\frac{b-5}{3} - \frac{2b-3}{5}$ $= \frac{5(b-5) - 3(2b-3)}{15}$ $= \frac{5b - 25 - 6b + 9}{15}$ $= \frac{-b - 16}{15}$	M1 M1 A1	Majority of students got 1 mark only. Common mistake : $\frac{b-5}{3} - \frac{2b-3}{5}$ $= \frac{5(b-5) - 3(2b-3)}{15}$ $= \frac{5b - 25 - 6b - 9}{15}$ $= \frac{-b - 34}{15}$
5	5 : 12 = 20 : 48 3 : 16 = 9 : 48 20 - 9 = 11 11 units → \$22 1 unit → \$2 20 units → 2 x 20 = \$40	M1 M1 A1	Well done.
6a	1888 = 2 ⁵ x 59 a = 5 b = 59	B1 B1	Well done

6b	8	B1	Many students left the answer as 2^3
6c	118	B1	Well done.
7a	$\frac{2.4}{\left(\frac{16}{60}\right)}$ $= 9 \text{ km/h}$	M1 A1	Students who got this wrong did not convert the time to hours.
7b	$\frac{900 \div 1000}{4} \times 60$ $= 13.5 \text{ min s}$	M1 A1	Badly done. Many did not divide by 1000.
7c	$\frac{2400 + 900}{(16 \times 60) + (13.5 \times 60)}$ $= 1.86 \text{ m/s}$	M1 A1	
8	$\frac{9}{4} : 0.75$ 9 : 3 3 : 1	M1 A1	
9ai	$-6c^2 - 4cd$ $= -2c(3c + 2d)$ <i>or</i> $= 2c(-3c - 2d)$	A1	
9aii	$2p(2q + p - 5)$	B2	Well done. One mark was given for the 2p factorised out correctly.
9b	$3 - (2x^2 + 4)$ $= 3 - 2x^2 - 4$ $= -2x^2 - 1$	M1 A1	Many managed to get $3 - 2x^2 - 4$ but simplified it wrongly.
10a	$x + 3 = 2x - 1$ $2x - x = 3 + 1$ $x = 2$	M1 A1	Well done.
10b	$\frac{2}{x} = \frac{3}{x+2}$ $3x = 2(x+2)$ $3x = 2x + 4$ $x = 4$	M1 A1	Students had an issue simplifying after cross-multiplication.
10c	$2 - \frac{x-9}{3} = -3$ $\frac{6-x+9}{3} = -3$ $15-x = -9$ $x = 24$	M1 M1 A1	Badly done. Students did not change the sign of '9' after making common denominator on the left.

11a	$q < -2$ 	B1 B1	Badly done. Students were able to solve the inequality but could not illustrate it on the number line correctly.
11b	$4q - 1 > 6$ $q > 1.75$ $q = 2$	M1 A1	Well done.
12	Length of square = $\sqrt{36} = 6\text{cm}$ Area = 10×6 = 60cm^2	M1 A1	Well done.
13	Draw a line BX through B $\angle ABX = 45^\circ$ (<i>corr \angles</i>) $\angle ABC = 360 - 275$ = 85° (<i>\angles at a pt</i>) $\angle XBC = 85 - 45$ = 40° Produce the line DC to Y $\angle BCY = 40^\circ$ (<i>alt \angles</i>) $x = 180 + 40$ = 220°	M1 (1 mark for any 2 correct reasons) A1	
14	$2(\pi \times 9 \times 9) + 2 \times \pi \times 9 \times h = 702\pi$ $162\pi + 18\pi h = 702\pi$ $18\pi h = 540\pi$ $h = 30\text{cm}$	M1 M1 A1	Average. Presentation of working for this question was done badly. Many remembered the formulas wrongly.

1E EOY PAPER 2 2017 MARKING SCHEME

Qn	Working	Marks	Marker's report
1a	$(12-2) \times 180$ $= 1800$	M1 A1	Reasonably done. Some students did not remember the formula.
1b	$45+46+29+12x = 360$ $12x = 240$ $x = 20$	M1 A1	Reasonably done. Some students went to calculate sum of interior angles instead.
2a	422499	B1	Mostly well done
2b	421500	B1	Mostly well done
3a	$\frac{1420-1300}{1300} \times 100$ $= 9.23\% \text{ or } 9\frac{3}{13}\%$	M1 A1	
3bi	$\frac{6750}{100} \times 95$ $= \$6412.50$	A1	
3bii	$\frac{6412.50}{100} \times 107$ $= \$6861.38$	M1 A1	
4a	$\frac{2p+5}{7} + \frac{3q+1}{4}$ $= \frac{4(2p+5) + 7(3q+1)}{28}$ $= \frac{8p+20+21q+7}{28}$ $= \frac{8p+21q+13}{28}$	M1 A1	Well done.
4b	$5(4a+5b) - 3(2a-7b)$ $= 20a+25b-6a+21b$ $= 14a+46b$	M1 A1	Reasonably done. Some students did not expand the second part of the question correctly.
4c	$18gh+9g-27gk$ $= 9g(2h-1-3k)$ M1 awarded for factorising one factor out correctly.	B2 OR	Not well done. Students are not familiar with factorisation.
5a	11	B1	Well done
5b	$2n+1$	B1	Reasonably done. But many students did not simplify their answers. Common errors

			include: $3+2(n-1)$ or $n+n-1$. $2 \times n - 1$ was penalised for presentation.
5c	501	B1	Well done. No ecf awarded.
6a	15	B1	Well done.
6b	249×3.50 $= \$871.50$	M1 A1	Well done. Same presentation error for some students who expressed answer as \$871.5
6c	39 : 44	B1	Well done.
7a	$x = 180 - 115 - 43$ $= 22^\circ(\text{int } \angle s)$	M1 A1	Well done.
7b	$\angle ABC = 180 - 90 - 43$ $= 47^\circ(\angle s \text{ in } \Delta)$ $y = 180 - 47$ $= 133^\circ(\angle s \text{ on strt line})$	M1	
7c	$z = 22 + 43$ $= 65^\circ(\text{vert opp } \angle s)$	A1 (Minus 1m for no reason in any of the parts)	Well done. Students who wrote (opp. angles) were penalised. Vertically opposite is the key word to be awarded marks for reasons. Ecf allowed for students who got 7a wrong.
9a	80	B1	Well done
9b	$\frac{140}{360}$ $= \frac{7}{18}$	M1 A1	Reasonably done. Some students miscalculated total as 340.
9c	$\frac{280}{360} \times 100$ $= 77.8\% \text{ or } 77\frac{7}{9}\%$	M1 A1	Reasonably done. Some students expressed answer as recurring decimal and was marked for accuracy.
9d	The bar graph is misleading as its vertical axis starts from 20 instead of 0, thus making the number of students who prefer Chocolate flavour look like it is twice the	B2	Badly done. A few students in the whole cohort got full credit. 1m was awarded for mentioning that the graph started at 20, 1m for showing

	number of students who prefer Vanilla flavour when it is only a difference of 60.		evidence of not having twice the numbers.
10a	$\frac{1}{2} \times 6 \times 8$ $= 24cm^2$	A1	Reasonably done.
10b	24×17 $= 408cm^2$	A1	Reasonably done.
10c	$Vol = (24 \times 2) + (17 \times 10) + (17 \times 6) + (17 \times 8)$ $= 456cm^2$	M1 A1	Reasonably done.
10d	$Volume\ of\ 10\ prisms = 408 \times 10$ $= 4080cm^3$ $Increase = \frac{4080}{\pi(10)^2}$ $= 13.0cm(3sf)$	M1 M1 A1	

