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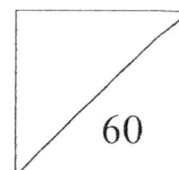
聖嬰中學

HOLY INNOCENTS' HIGH SCHOOL

Name of Student

Class

Index Number



END-OF-YEAR EXAMINATION 2015
SECONDARY 1 EXPRESS
MATHEMATICS PAPER 1

4048/01

Date: 8 Oct 2015

Duration: 1 h 30 min

Students answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

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

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use paper clips, glue or correction tape/fluid.

Answer **ALL** questions.

The number of marks is given in brackets [] at the end of each question or part question.

If working is needed for any question it must be shown in the space below the question.

Omission of essential working will result in loss of marks.

The total of the marks for this paper is **60**

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 answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

Set by: Ms Cheryl Chew

Vetted by: Mdm Hayati

Ms Goh Lay Ching

Answer **all** the questions.

- 1 By rounding each number to the nearest whole number, estimate the value of

$$\frac{\sqrt{9.3}}{\sqrt[3]{26.9}}.$$

Answer [2]

- 2 (a) The number of spectators at a football match is 149 500 when rounded off to 4 significant figures.

What is the smallest number of spectators that were present?

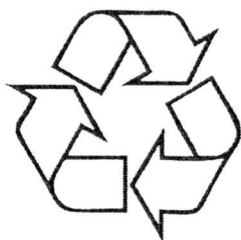
- (b) Arrange the following numbers in ascending order.

$$30\%, \quad -0.3, \quad \frac{16}{50}, \quad 0.\dot{3}, \quad 0.33.$$

Answer (a) [1]

(b) [1]

3 For the following diagram,



write down

- (a) the number of lines of symmetry,
- (b) the order of rotational symmetry.

Answer (a) [1]

(b) [1]

4 Consider the following numbers.

$$-8, \frac{\pi}{5}, \frac{9}{\sqrt{3}}, \sqrt{5}, \sqrt[3]{8}, 125.$$

Write down

- (a) all irrational number(s),
- (b) all perfect cube number(s),
- (c) all prime number(s).

Answer (a) [1]

(b) [1]

(c) [1]

121

- 5 (a) Solve the inequality $-2x \geq -27 + x$.
- (b) Hence write down the largest prime number x that satisfies the inequality

$$-2x \geq -27 + x.$$

Answer (a) [2]

(b) [1]

-
- 6 (a) (i) Express 56 as a product of its prime factors.
- (ii) Find the smallest integer, n , such that $56n$ is a perfect square.
- (b) p leaves a remainder of 1 when divided by 2, 3 or 7.
- Find the smallest integer value of p .

Answer (a)(i) $56 =$ [1]

(ii) $n =$ [1]

(b) [2]

- 7 Susan has a mass of $3x$ kg and Charlene has a mass that is 6 kg less than Susan. The mass of Kelly is half of the total mass of Susan and Charlene.

Write an expression, in terms of x , for

- (a) Charlene's mass,
(b) the average mass of the 3 girls.

Answer (a)kg [1]

(b)kg [2]

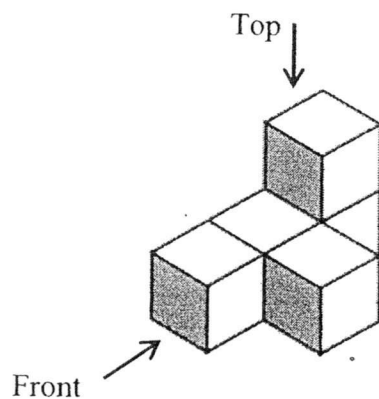
-
- 8 (a) Simplify $a \times a + 3a \times b - 2b \times a$.
(b) Factorise $5x^2y^2 - 20xy^2$ completely.

Answer (a) [1]

(b) [1]

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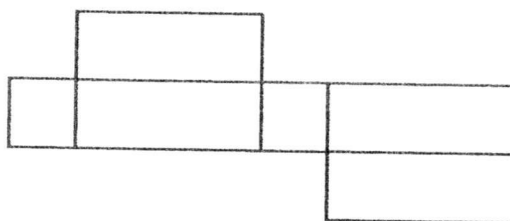
- 9 (a) The solid shown below is made up of cubes.
Draw the front view and top view of the solid in the answer space below.



Answer (a) [2]

<u>Front View</u>	<u>Top View</u>
-------------------	-----------------

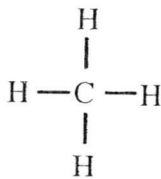
- (b) Draw a sketch of the solid that can be formed by the net shown below.



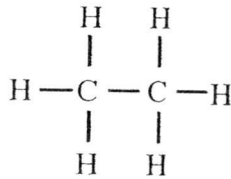
Answer (b)

[1]

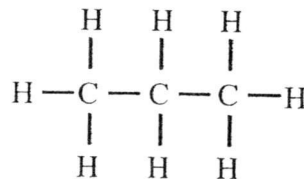
- 10 The first three members of a family of hydrogen, H, and carbon, C, compounds have bonding structures as shown below.



1st Member
 $n = 1$



2nd Member
 $n = 2$



3rd Member
 $n = 3$

- (a) Draw the bonding structure for the 4th member of the family.
Answer (a)

[1]

The table below shows the number of carbon atoms and hydrogen atoms in each member of the family of chemical compounds.

n	Number of Carbon atoms	Number of Hydrogen atoms
1	1	4
2	2	6
3	3	8
...	...	...
n	n	T_n

- (b) Find the number of hydrogen atoms in the structure for the 10th member of the family.
- (c) Find the general term, T_n , for the number of hydrogen atoms for the n^{th} member of the family.

Answer (b) [1]

(c) [1]

123

- 11** In June, Sarah spent 20% of her income and saved the rest.
Sarah's monthly income is \$2000.
- (a) Find the amount she spent in the month of June.
- (b) In July, Sarah increased her expenditure and spent 30% of her income.
Find the percentage increase in her expenditure from June to July.

Answer (a) [1]

(b)% [2]

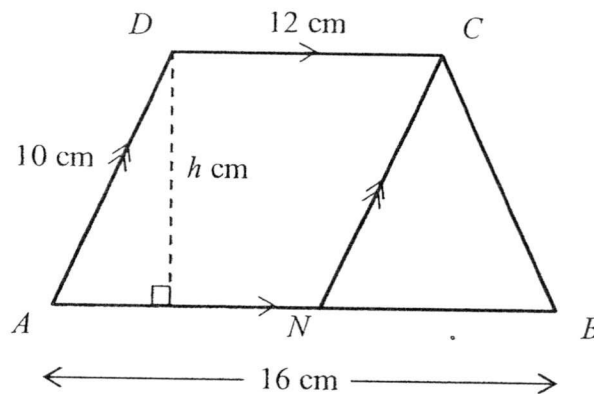
-
- 12** The sum of exterior angles of a polygon with n sides is $\frac{1}{3}$ the sum of its interior angles.

- (a) Find the value of n .
- (b) Name this polygon.

Answer (a) [3]

(b) [1]

- 13 In the diagram, $ABCD$ is a trapezium with $DC = 12$ cm, $AD = 10$ cm and $AB = 16$ cm. DC is parallel to AB and AD is parallel to NC .



Given that the area of trapezium $ABCD = 112 \text{ cm}^2$, calculate

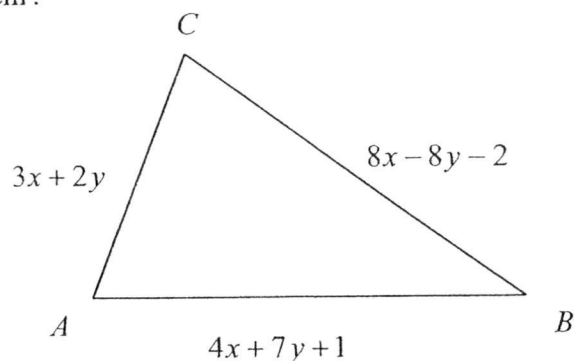
- (a) the value of h ,
(b) the area of parallelogram $ANCD$.

Answer (a) $h = \dots\dots\dots$ [2]

(b) $\dots\dots\dots \text{ cm}^2$ [2]

124

- 14 The lengths of three sides of triangle ABC are $(3x + 2y)$ cm, $(8x - 8y - 2)$ cm and $(4x + 7y + 1)$ cm.



- (a) Write down and simplify, an expression in terms of x and y , for the perimeter of the triangle.
- (b) It is given that $x = 4\frac{1}{2}$ and $y = 1$.
- (i) Find the perimeter of the triangle.
- (ii) What type of triangle is triangle ABC ?

Answer (a)cm [2]

(b) (i) cm [1]

(ii) [1]

- 15 The charges for printing and framing photographs at Filmhub and Picturehub are given in the table below.

	Filmhub	Picturehub
Printing service	\$0.15 per photograph	\$0.18 per photograph
Framing service	\$3 per photograph	\$2.80 per photograph

- (a) Calculate
- (i) the amount you need to pay to print 80 photographs at Filmhub,
 - (ii) the number of photographs you can frame at Picturehub with \$392.
- (b) You need to print and frame 50 photographs.

Find the amount you would save if you use the services at Picturehub instead of Filmhub.

Answer (a) (i) \$..... [2]

(ii) [2]

(b) \$..... [2]

105

- 16 (a) Subtract $(2 + x + 4y)$ from $(5x - 2y)$.
Leave your answer in its simplest form.

(b) Simplify

(i) $-\frac{x}{2} + 3y - 2(4y - x),$

(ii) $\frac{3(x-3)}{2} - \frac{2x}{5}.$

Answer (a) [2]

(b) (i) [2]

(ii) [2]

- 17 In a quadrilateral $ABCD$, $AB = 6.5$ cm, $BC = 4.8$ cm and $CD = 8.5$ cm.
It is also given that $\angle ABC = 115^\circ$, $\angle BCD = 98^\circ$.
The side AB is drawn in the answer space below.

- (a) Using a ruler and compasses, construct quadrilateral $ABCD$. [2]
- (b) Measure and write down $\angle DAB$.
- (c) On the same diagram, construct and label clearly
- (i) the perpendicular bisector of AD , [1]
- (ii) the angle bisector of $\angle ADC$. [1]
- (d) Mark the point M where the two bisectors meet.
Measure the length of AM .

Answer (a), (c) and (d)

A ————— B

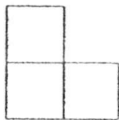
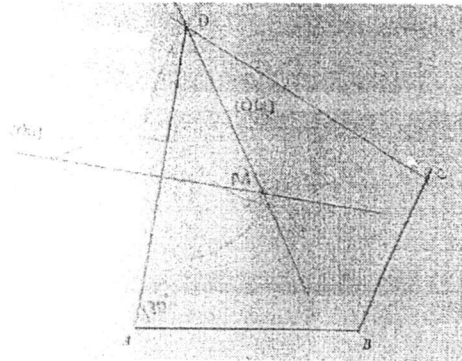
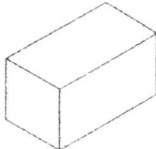
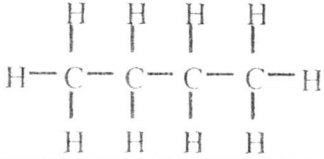
Answer (b) $\angle DAB = \dots\dots\dots^\circ$ [1]

(d) $\dots\dots\dots$ cm [1]

126

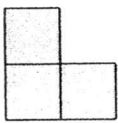
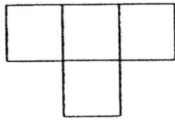
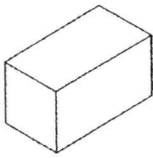
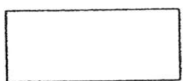
END OF PAPER

Answer Key

1	1	10b	22
2a	149 450	10c	$2n + 2$
2b	$-0.3, 30\%, \frac{16}{50}, 0.33, 0.\dot{3}$	11a	\$400
3a	0	11b	50%
3b	3	12a	8
4a	$\frac{\pi}{5}, \frac{9}{\sqrt{3}}, \sqrt{5}$	12b	Octagon
4b	$-8, 125$	13a	$h = 8$
4c	$\sqrt[3]{8}$	13b	96cm^2
5a	$x \leq 9$	14a	$(15x + y - 1)\text{cm}$
5b	7	14b	$67\frac{1}{2}\text{cm}$
6ai	$2^3 \times 7$	14c	Isosceles triangle or Acute-angled triangle.
6aii	14	15ai	\$12
6b	43	15aii	140
7a	$3x - 6$	15b	\$8.50
7b	$3x - 3$	16a	$4x - 6y - 2$
8a	$a^2 + ab$	16bi	$\frac{3x}{2} - 5y$
8b	$5xy^2(x - 4)$	16bii	$\frac{11x - 45}{10}$
9a	Front View  Top View 	17a	
9b		17b	81°
10a		17d	5.4 cm

Mark Scheme for 2015 Sec 1 Express EOY Mathematics Paper 1

Qn	Answer	Marks	Remarks
1a	$\frac{\sqrt{9.3}}{\sqrt[3]{26.9}}$ $= \frac{\sqrt{9}}{\sqrt[3]{27}}$ $= 1$	M1 A1	
2a	149 450	B1	
2b	$-0.3, 30\%, \frac{16}{50}, 0.33, 0.\dot{3}$	B1	
3a	0	B1	
3b	3	B1	
4a	$\frac{\pi}{5}, \frac{9}{\sqrt{3}}, \sqrt{5}$	B1	
4b	$-8, 125$	B1	
4c	$\sqrt[3]{8}$	B1	
5a	$-2x \geq -27 + x$ $-3x \geq -27$ $x \leq \frac{-27}{-3}$ $x \leq 9$	M1 A1	Award M1 if student wrote $27 \geq 3x$ instead
5b	7	B1	
6ai	$56 = 2^3 \times 7$	B1	
6aii	$n = 2 \times 7$ $= 14$	B1	
6b	$\text{LCM} = 2 \times 3 \times 7$ $= 42$ $p = 42 + 1$ $= 43$	M1 A1	
7a	$3x - 6$	B1	
7b	$\text{Kelly's weight} = \frac{3x + 3x - 6}{2}$ $= (3x - 3) \text{ kg}$ $\text{Average weight} = \frac{3x + 3x - 6 + 3x - 3}{3}$ $= (3x - 3) \text{ kg}$	M1 A1	
8a	$a \times a + 3a \times b - 2b \times a$ $= a^2 + ab$	B1	
8b	$5x^2y^2 - 20xy^2$ $= 5xy^2(x - 4)$	B1	

9a	Front View  Top View 	B1 (each)	Award mark for front view even if student did not shade the squares. Do not award marks if rectangles instead of squares are drawn
9b		B1	Do not accept plane figure 
10a	$ \begin{array}{cccc} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{H} \\ & & & & \\ & \text{H} & \text{H} & \text{H} & \text{H} \end{array} $	B1	
10b	$2(10) + 2 = 22$	B1	
10c	$2n + 2$	B1	
11a	Amount spent in June = $\frac{20}{100} \times 2000$ = \$400	B1	
11b	July's expenditure = $\frac{30}{100} \times 2000$ = \$600 Percentage increase in expenditure from June to July $= \frac{600 - 400}{400} \times 100\%$ = 50%	M1 A1	
12a	sum of interior angles = $360^\circ \times 3$ = 1080° $(n - 2) \times 180^\circ = 1080^\circ$ $n = \frac{1080}{180} + 2$ = 8	M1 M1 A1	
12b	Octagon	B1	
13a	$\frac{1}{2} \times (12 + 16) \times h = 112$ $h = 8$	M1 A1	

13b	Area of parallelogram $ANCD = 12 \times 8$ $= 96 \text{ cm}^2$	M1 A1	
14a	Perimeter $= 3x + 2y + 8x - 8y - 2 + 4x + 7y + 1$ $= (15x + y - 1)\text{cm}$	M1 A1	
14b	Perimeter $= 15(4\frac{1}{2}) + 1 - 1$ $= 67\frac{1}{2}\text{cm}$	B1	
14c	Isosceles triangle or Acute-angled triangle.	B1	Do not award mark for spelling error
15ai	Amount I need to pay $= 80 \times \$0.15$ $= \$12$	M1 A1	
15aii	Number of photographs $= \frac{\$392}{\$2.80}$ $= 140$	M1 A1	
15b	Amount saved per photograph $= (\$0.15 + \$3) - (\$0.18 + \$2.80)$ $= \$0.17$ Total amount saved for 50 photographs $= 50 \times \$0.17$ $= \$8.50$ <i>Alternative method:</i> Amount cost at Filmhub $= 50 \times (\$0.15 + \$3)$ $= \$157.50$ Amount cost at Picturehub $= 50 \times (\$0.18 + \$2.80)$ $= \$149$ Total amount saved $= \$157.50 - \149 $= \$8.50$	M1 A1 M1 A1	
16a	$5x - 2y - (2 + x + 4y)$ $= 5x - 2y - 2 - x - 4y$ $= 4x - 6y - 2$	M1 A1	
16bi	$-\frac{x}{2} + 3y - 2(4y - x) = -\frac{x}{2} + 3y - 8y + 2x$ $= \frac{3x}{2} - 5y$	M1 A1	Do not accept $1\frac{1}{2}x - 5y$

16bii	$\frac{3(x-3)}{2} - \frac{2x}{5} = \frac{15x-45-4x}{10}$ $= \frac{11x-45}{10}$	M1 A1	Award mark for common denominator
17a	Refer to the last page.	B1 (BC) B1 (CD) B1 (perpen. Bisector) B1 (Angle Bisector)	
17b	81°	B1	Accept 81° ± 1°
17d	5.4 cm	B1	Accept (5.4 ± 0.1) cm



聖嬰中學

HOLY INNOCENTS' HIGH SCHOOL

Name of Student

Class

Index Number

END-OF-YEAR EXAMINATION 2015
SECONDARY 1 EXPRESS
MATHEMATICS PAPER 2

4048/01

Date: 2 Oct 2015

Duration: 1 h 30 min

Additional Materials: **5 sheets of Writing Paper**
 1 sheet of Graph Paper

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use paper clips, glue or correction tape/fluid.

Answer **ALL** questions.

The number of marks is given in brackets [] at the end of each question or part question.

If working is needed for any question it must be shown in the space below the question.

Omission of essential working will result in loss of marks.

The total of the marks for this paper is **60**

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 answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

Set by: Mdm Hayati

Vetted by: Ms Goh Lay Ching

This document consists of 8 printed pages (including cover page).

Answer **all** the questions.

- 1 In an election, 87% of the people who were eligible to vote cast their votes.

There were 3 candidates in the election

The table below illustrates the number of votes received by each candidate.

Candidates	Number of votes received
Candidate X	x
Candidate Y	49 938
Candidate Z	21 402

- (a) The number of votes for the 3 candidates, X, Y, Z, were in the ratio 4 : 7 : 3. Calculate the value of x . [2]
- (b) Calculate the total number of people who were eligible to vote. [2]
- (c) Jane drew a pictogram to represent the results of the election.

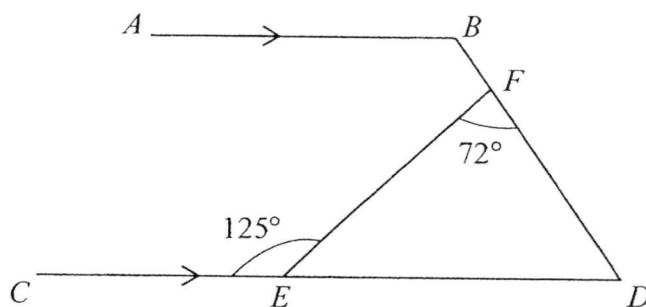
Candidate X	    
Candidate Y	      
Candidate Z	  
 represents 7000 votes	

- (i) Explain why the pictogram may be considered misleading. [1]

- (ii) Amy wants to represent the data using a pie chart instead.

Explain why using a pie chart is a better representation of the data? [1]

- 2 (a) In the diagram, the line AB is parallel to CED .
 $\angle CEF = 125^\circ$ and $\angle EFD = 72^\circ$.



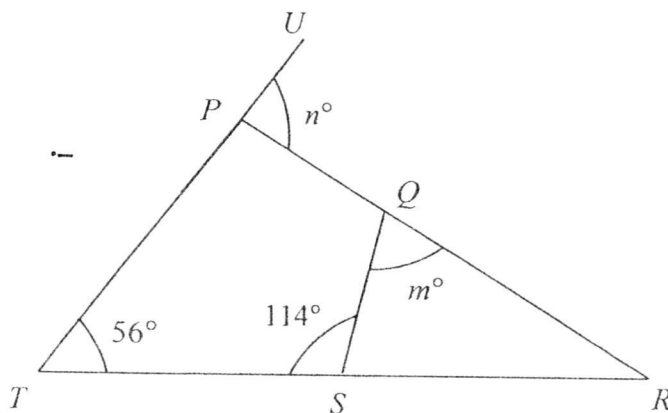
Calculate

- (i) $\angle EDF$, [1]
 (ii) reflex $\angle ABD$. [2]

- (b) In the diagram TSR , TPU and PQR are straight lines.
 $\angle PTS = 56^\circ$ and $\angle TSQ = 114^\circ$.

Find the value of $m + n$.

[2]



- 3 Shirley opened a saving account by investing \$2400.
 The account pays simple interest at the rate of 4.8% per year.

- (a) Calculate the total amount in Shirley's account after 3 years. [2]
 (b) Karen deposited \$ P in her saving account.
 This account pays simple interest at the rate of 4% per year.
 At the end of 3 years, the amount of interest Karen received is twice as much as the interest Shirley received.

Calculate the value of P .

[3]

4 (a) A submarine is 68 m below sea level.

- (i) A jet fighter which is 354 m above sea level dropped a bomb to hit the submarine.

Find the vertical distance travelled by the bomb. [1]

- (ii) A falcon is midway between the submarine and the jet fighter.

Find the distance of the falcon above sea level. [2]

(b) A rectangular room measures 6 m by 5.5 m.

A contractor wants to tile the floor with identical square tiles to fit the room.

- (i) Find the largest possible length of each tile. [2]

- (ii) Find the maximum number of tiles needed. [1]

5 (a) Evaluate

$$\sqrt{7^2 + 2 \times (-8.2) \times \frac{3}{4}},$$

giving your answer correct to 2 significant figures. [2]

(b) Solve

(i) $\frac{1}{3}(x + 6) = 3 - (2 - x),$ [2]

(ii) $\frac{10}{2x + 5} - 3 = 0.$ [2]

- 6 Jessie bought a few books during her trip to Melbourne. The diagram below shows the receipt issued by the book store. Some of the printouts on the receipt have faded and they are indicated by the black boxes. You have to help Jessie recover the details of her purchases.

All purchases are made in Australian Dollar (AUD).

FAVOURED BOOK COMPANY				
One Emporium Melbourne Store				
VIC, 3000				
ITEM	QTY	PRICE AUD	DISC AUD	TOTAL
ART OF CHARLIE CHAN	1	29.90		29.90
YOU SAY, I SAY	1	15.40		11.55
STYLISTICS	1	30.80	15.40	15.40
[Total Discount =			19.25]	

ITEMS PURCHASED:	3			
TOTAL	AUD			
10% GST INCLUDED IN TOTAL				

27/8/2015	17:19	001	Slip: 123456789	
TEMP100001			Trans: 456123	
You were served by Jasnina DAVIS				

- (a) Find total amount, in AUD, in Jessie's receipt. [1]
- (b) Find the percentage discount given to the book "You Say, I Say" [2]
- (c) The total amount is inclusive of 10% GST.
Calculate the GST amount, in AUD. [2]
- (d) On 27 Aug 2015 the rate of exchange between Australian Dollar (AUD) and Singapore Dollar (SGD) was 1 AUD = 1.18 SGD.

Calculate the total amount of the purchases in SGD. [1]

- (e) Jessie claims that the original price of the book "Stylistics" is 50% more than the book "You Say, I Say".

Do you agree with Jessie? Justify your answer with clear working. [2]

131

- 7 (a) During the 2015 SEA Games, Singapore national swimmer Quah Zheng Wen set a new national record of 25.27 s in the 50 m backstroke event.

Express his speed in km/h, giving your answer correct to 2 decimal places. [2]

- (b) Kelly makes a trip from office A to office B for a meeting.
The distance between office A and office B is 250 km.

- (i) Kelly travels x km for the first part of her trip at an average speed of 60 km/h before she stops to have her lunch.

Write down an expression, in terms of x , for the time taken, in hours, to travel the first part of her trip. [1]

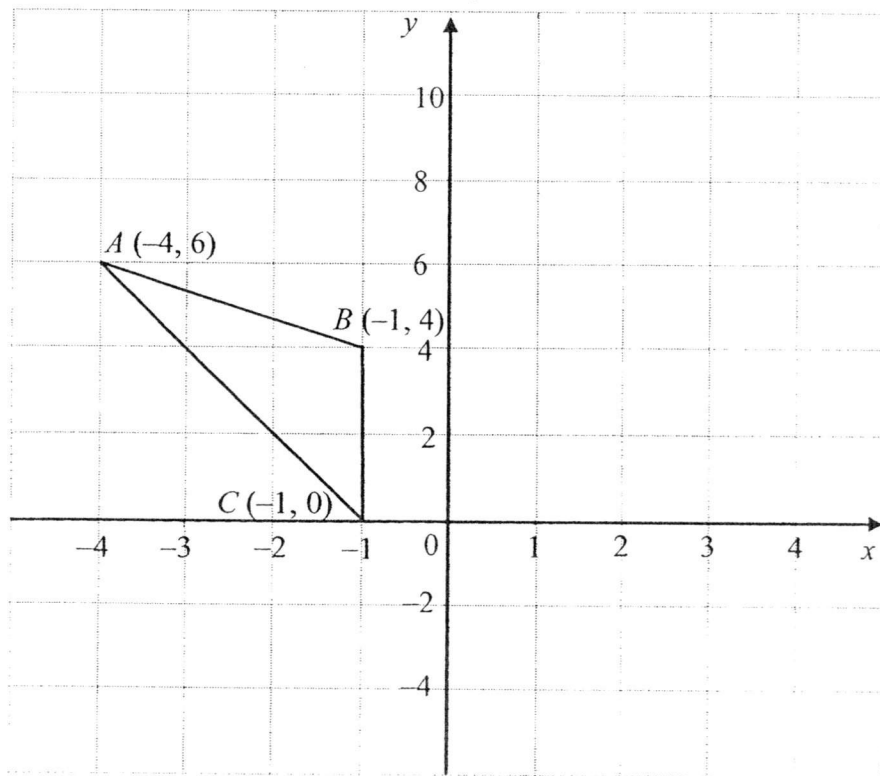
- (ii) After her lunch, Kelly continues the second part of her trip, travelling the remaining distance at an average speed of 80 km/h to office B.

Write down an expression, in terms of x , for the time taken, in hours, to travel the second part of her trip. [1]

- (iii) Given that the total time taken for the whole trip is $3\frac{1}{2}$ hours, form an equation in x and solve it. [3]

- (iv) Find the time taken, in hours, for the second part of her trip. [1]

- 8 (a) The diagram shows a triangle ABC .
 A is $(-4, 6)$, B is $(-1, 4)$ and C is $(-1, 0)$.



- (i) Write down the gradient of the line AB . [1]
- (ii) $ABDC$ is a parallelogram.
 Write down the coordinates of point D . [1]
- (iii) A point E lies on the x -axis such that triangle EBC has the same area as triangle ABC .
 Write down one possible coordinates of the point E . [1]

(b) Answer the whole of this question on a sheet of graph paper.

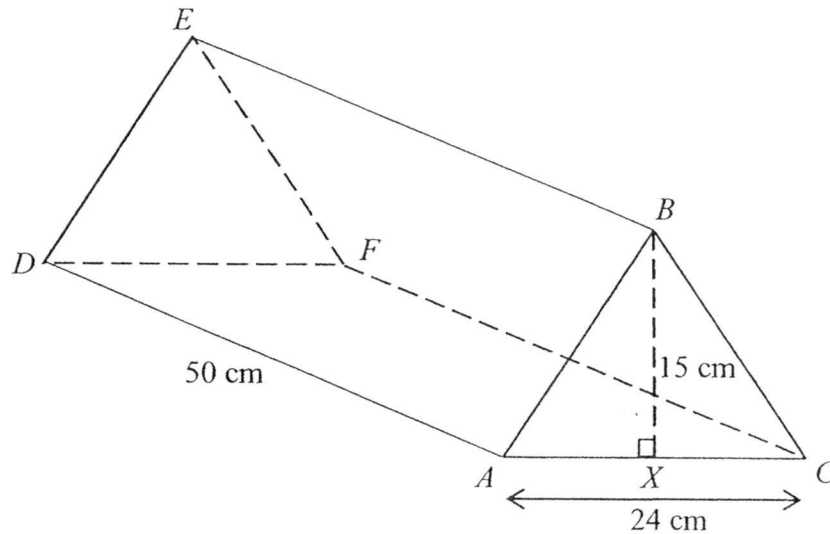
- (i) The variables x and y are connected by the equation $2x + y = 3$.
 Some corresponding values of x and y are given in the table below.

x	-2	0	1	p	4
y	7	3	1	0	-5

Find the value of p . [1]

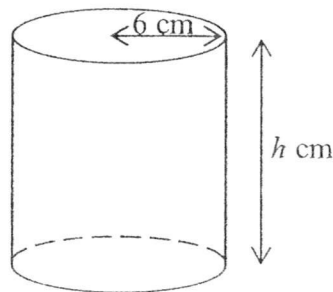
- (ii) Using a scale of 2 cm to 1 unit on x -axis and 1 cm to 1 unit on y -axis, plot the points in the table.
 Draw and label clearly the graph $2x + y = 3$. [2]
- (iii) On the same axes, draw the graph $y = -2$.
 Write down the x -coordinate of the point where the two graphs intersect. [2]

- 9 The diagram shows a solid prism whose cross-section is a triangle ABC .
 $AC = 24$ cm, $BX = 15$ cm and $AD = 50$ cm.



[Take $\pi = 3.142$]

- (a) Find the volume of the prism. [2]
- (b) The solid prism was melted and recast into 5 identical cylindrical solids with radius 6 cm and height h cm.
 One such cylindrical solid is shown in the diagram below.



Show that the height, h , of each cylindrical solid, when rounded to the nearest whole number, is 16 cm. [2]

- (c) (i) Kevin wanted to paint the external surfaces of the 5 cylindrical solids using spray paint.

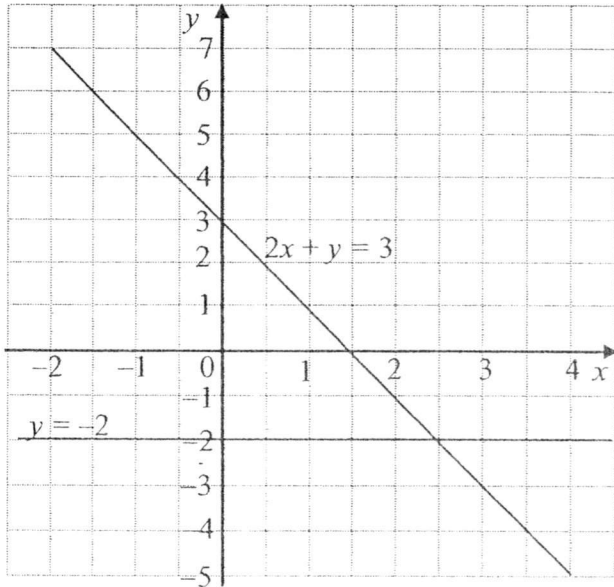
Using the value of h in part (b), find the total area of the surfaces to be painted.
 Leave your answer in terms of π . [2]

- (ii) One can of spray paint covers an area of 600 cm^2 .

Given that a can of spray paint costs \$5.50, calculate the amount of money Kevin would have to spend on painting. [2]

END OF PAPER

Answer Key

1(a)	$x = 28\,536$	7(a)	7.12 km/h (correct to 2 dp)
1(b)	Total number of people eligible to vote = 114 800	7(b)(i)	$\frac{x}{60}h$
1(c)(i)	The symbols to represent the number of votes are unequal in size. The pictogram seems to show that Candidate Y received a lot more votes than the actual number of votes.	7(b)(ii)	$\frac{250-x}{80}h$
		7(b)(iii)	$\frac{x}{60} + \frac{250-x}{80} = 3\frac{1}{2}$ $x = 90$
1(c)(ii)	Pie chart is able to show proportion of each candidate in comparison with the total number of votes.	7(b)(iv)	2 hours
		8(a)(i)	Gradient of $AB = -\frac{2}{3}$
2(a)(i)	$\angle EDF = 53^\circ$	8(a)(ii)	$D(2, -2)$
2(a)(ii)	Reflex $\angle ABD = 233^\circ$	8(a)(iii)	$E(-4, 0)$ or $E(2, 0)$
2(b)	$m + n = 170$	8(b)(i)	$p = 1\frac{1}{2}$
3(a)	Total amount = \$2745.60		
3(b)	$P = \$5760$		
4(a)(i)	Vertical distance = 422 m		
4(a)(ii)	Dist above sea level = 143 m		
4(b)(i)	Largest length = 50 cm		
4(b)(ii)	Max number of tiles = 132		
5(a)	6.1 (correct to 2 sig fig)		
5(b)(i)	$x = 1\frac{1}{2}$		
5(b)(ii)	$x = -\frac{5}{6}$		
6(a)	Total amount = 56.85 AUD		
6(b)	% discount = 25%		
6(c)	GST = 5.17 AUD		
6(d)	67.08 SGD		
6(e)	I don't agree with Jessie's claim. If "Stylistics" is 50% more than "You Say, I Say" then its price should be $\frac{150}{100} \times 15.40 = 23.10$ AUD and not 30.80 AUD. OR If "Stylistics" is 50% more than "You Say, I Say" then its price should be $\frac{15.40}{15.40} \times 100\% = 100\%$ more than the price of "You Say, I Say".	8(b)(iii)	$x = 2\frac{1}{2}$
		9(a)	Volume of prism = 9000 cm^3
		9(b)	$\pi \times 6^2 \times h = 1800$ $h = \frac{1800}{36\pi} \approx 16\text{ cm}$
		9(c)(i)	Total surface area = 1320π
		9(c)(ii)	Cost = \$38.50

End-of-Year Examination 2015 Marking Scheme
Sec 1 Express Mathematics Paper 2

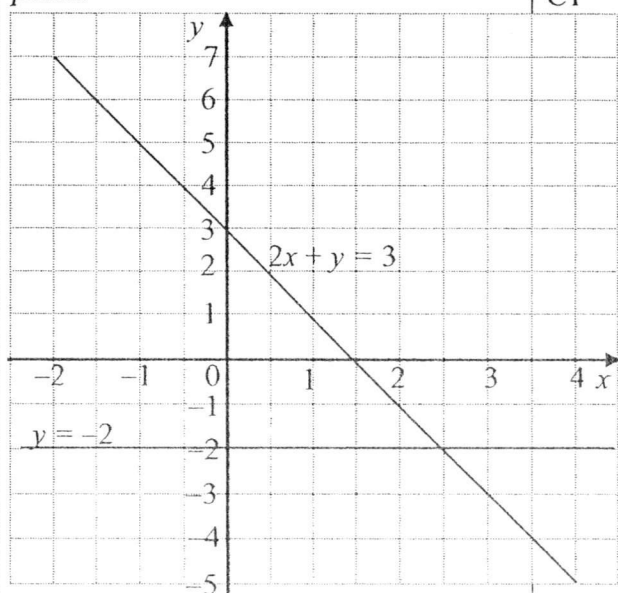
Question No	Marking Point	Marks Awarded	Total Marks	Remarks
1 (a)	$x = \frac{49938}{7} \times 4$ $= 28\,536$	M1 A1	2	Alternative method $x = \frac{21402}{3} \times 4$ $= 28\,536$
(b)	Total number of votes received $= 28\,536 + 49\,938 + 21\,402$ $= 99\,876$ No of ppl eligible to vote $= \frac{99876}{87} \times 100$ $= 114\,800$	M1 A1	2	
(c) (i)	The symbols to represent the number of votes are unequal in size. The pictogram seems to show that Candidate Y received a lot more votes than the actual number of votes.	B1	1	
(ii)	Using pie chart is a better representation as pie chart is able to show proportion of each candidate in comparison with the total number of votes	B1	1	
2 (a) (i)	$\angle EDF = 125^\circ - 72^\circ$ $= 53^\circ$ (exterior $\angle$ of Δ)	B1	1	
(ii)	$\angle ABD = 180^\circ - 53^\circ$ $= 127^\circ$ Reflex $\angle ABD = 360^\circ - 127^\circ$ $= 233^\circ$	M1 A1	2	
(b)	$180 - n + 180 - m + 56 + 114 = 360$ $170 - n - m = 0$ $m + n = 170$	M1 A1	2	
3 (a)	Interest $= 2400 \times \frac{4.8}{100} \times 3$ $= \$345.60$ Total amount $= 2400 + 345.60$ $= \$2745.60$	M1 A1	2	

134

Question No	Marking Point	Marks Awarded	Total Marks	Remarks
3 (b)	$P \times \frac{4}{100} \times 3 = 2(345.60)$ $P = \frac{691.2 \times 100}{12}$ $= \$5760$	M1 M1 A1	3	M1 for forming equation correctly.
4 (a) (i)	Vertical distance = $354 - (-68)$ = 422 m	B1	1	
(ii)	Dist above sea level = $354 - \left(\frac{422}{2}\right)$ = 143 m	M1 A1	2	M1 for $\left(\frac{422}{2}\right)$
(b) (i)	$6 \text{ m} = 600 \text{ cm}$ $= 2^3 \times 3 \times 5^2$ $5.5 \text{ m} = 550 \text{ cm}$ $= 2 \times 5^2 \times 11$ $\text{HCF} = 2 \times 5^2 = 50 \text{ cm}$ $\text{Largest length} = 50 \text{ cm}$	M1 A1	2	M1 for prime factorisation
(ii)	$\text{No of tiles} = \frac{600}{50} \times \frac{550}{50}$ $= 12 \times 11$ $= 132$	B1	1	
5 (a)	6.058 ≈ 6.1 (correct to 2 sig fig)	B1 B1	2	
(b) (i)	$\frac{1}{3}x + 2 = 3 - 2 + x$ $\frac{2}{3}x = 1$ $x = 1\frac{1}{2}$	M1 A1	2	M1 for correct expansion
(ii)	$10 = 3(2x + 5)$ $10 = 6x + 15$ $x = -\frac{5}{6}$	M1 A1	2	M1 for eliminating the denominator

Question No	Marking Point	Marks Awarded	Total Marks	Remarks
6 (a)	Total amount = 29.90 + 11.55 + 15.40 = 56.85 AUD	B1	1	
(b)	Discount = 15.40 – 11.55 = 3.85 % discount = $\frac{3.85}{15.4} \times 100\%$ = 25%	M1 A1	2	<u>Alternative method</u> Discount = 19.25 – 15.40 = 3.85 AUD
(c)	GST = $\frac{10}{110} \times 56.85$ = 5.17 AUD	M1 A1	2	
(d)	1 AUD = 1.18 SGD 56.85 AUD = 56.85 × 1.18 SGD = 67.083 ≈ 67.08 SGD	B1	1	
(e)	50% more than “You Say, I Say” = $\frac{150}{100} \times 15.40$ = 23.10 AUD The price of “Stylistics” is 30.80 AUD not 23.10 AUD. Therefore the price of “Stylistics” is not 50% more than “You Say, I Say”. I don’t agree with Jessie’s claim.	B1 B1	2	The price of “Stylistics” is 15.40 AUD more than “You Say, I Say”. Compare to “You Say, I Say”, “Stylistics” is $\frac{15.40}{15.40} \times 100\% = 100\%$ more than the price of “You Say, I Say”
7 (a)	Speed = $\frac{50}{25.27}$ m/s = $\frac{50 \times 3600}{25.27 \times 1000}$ = 7.123 ≈ 7.12 km/h (correct to 2 dp)	M1 A1	2	M1 for converting m to km or s to hr
(b) (i)	Time taken = $\frac{x}{60}$ h	B1	1	
(ii)	Time taken = $\frac{250 - x}{80}$	B1	1	
(iii)	$\frac{x}{60} + \frac{250 - x}{80} = 3\frac{1}{2}$ $\frac{4x + 3(250 - x)}{240} = 3\frac{1}{2}$ $4x + 750 - 3x = 840$ $x = 90$	M1 ✓ M1 A1	3	M1 for forming correct equation 135

Question No		Marking Point	Marks Awarded	Total Marks	Remarks
7	(iv)	Time = $\frac{250 - 90}{80} = 2$ h	B1	1	
8	(a) (i)	Gradient of $AB = -\frac{2}{3}$	B1	1	B1 for either one of the coordinates
	(ii)	$D(2, -2)$	B1	1	
	(iii)	$E(-4, 0)$ or $E(2, 0)$	B1	1	
	(b) (i)	$p = 1\frac{1}{2}$	B1	1	
	(ii)	Draw axes and plot all points correctly Draw straight line graph through all points	P1 C1	2	
	(iii)	The line $y = -2$ drawn correctly. $x = 2\frac{1}{2}$	B1 B1	2	
9	(a)	Cross sectional area = $\frac{1}{2} \times 24 \times 15$ $= 180 \text{ cm}^2$	M1	2	
		Volume = 180×50 $= 9000 \text{ cm}^3$	A1		
	(b)	Volume of each solid = $\frac{9000}{5} = 1800$	M1	2	
		$\pi \times 6^2 \times h = 1800$ $h = \frac{1800}{36\pi}$ $= 15.91$ ≈ 16 (nearest whole number)	A1		



Question No	Marking Point	Marks Awarded	Total Marks	Remarks
9 (c) (i)	Total surface area $= 5(2 \times \pi \times 6^2 + 2 \times \pi \times 6 \times 16)$ $= 5(72\pi + 192\pi)$ $= 1320\pi$	M1	2	M1 for correct area of 2 circles or curved surface area
		A1		
	(ii) No of bottle $= \frac{1320\pi}{600}$ $= 6.91$ ≈ 7 bottles Cost $= 7 \times 5.5$ $= \$38.50$	M1	2	
		A1		

136