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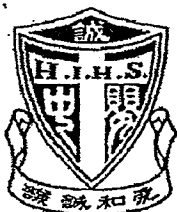
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聖嬰中學
HOLY INNOCENTS' HIGH SCHOOL

MID-YEAR EXAMINATION 2014
SECONDARY 1 EXPRESS

MATHEMATICS

4016/01

Paper 1

Name : _____

Date : 16 May 2014

Register No : _____

Duration : 1 h 30 min

Class : _____

Marks : /60

Additional Materials needed: NIL

Students answer on the Question Paper.

Instructions to Candidates

Write your 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.

Calculators should be used 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, unless the question requires the answer in terms of π .

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

The total marks for this paper is 60.

Setter: Mr Jarrod Tan

This paper consists of 11 printed pages, inclusive of this cover page.

Answer all the questions.

- 1 (a) 25% of a number is 30. Find the number.
- (b) Mina bought 250 bulbs. 8% of the bulbs are spoilt after less than 10 hours of use. Find the number of bulbs that lasted for at least 10 hours.

Answer (a) [1]

(b)bulbs [1]

- 2 Evaluate $\frac{20\pi - 26.8}{\sqrt{22.57 \div 0.03}}$.

Answer [2]

- 3 Express

- (a) 0.0376 correct to the nearest hundredth,
- (b) -127.792 correct to the nearest integer.

Answer (a) [1]

(b) [1]

- 4 "343 is a prime number".
State whether this statement is true or false. Give reasons for your answer.

Answer: [2]

- 5 Arrange the following numbers in ascending order.

$$-(1.346)^2, \quad -1.\dot{8}\dot{1}, \quad -1.8\dot{1}, \quad -\sqrt{\frac{43}{13}}, \quad -\frac{181}{1000}$$

Answer [2]

- 6 Mrs Lim has 2 daughters, Helen and Melissa.
The highest common factor and lowest common multiple of their ages are 3 and 168 respectively. If Helen is 3 years older than her sister, find Helen's age.

Answer years old [2]

- 7 The freezing point of a liquid is -7°C .
The temperature difference between its freezing point and boiling point is 25°C .

- (a) Find the boiling point of the liquid.
- (b) An addition of a small quantity of salt into the liquid decreased its freezing point by 0.8°C and increased its boiling point by 0.7°C .

Find the temperature difference between the freezing point and the boiling point of this liquid-salt mixture.

Answer (a) $^{\circ}\text{C}$ [1]

(b) $^{\circ}\text{C}$ [2]

- 8 Given the list of numbers

$$\sqrt[3]{6}, 0, \sqrt{121}, \pi, 2.\dot{1}, \frac{151}{-3}, 1, -\sqrt{25},$$

write down

- (a) the integer(s),
- (b) the irrational number(s),
- (c) the prime number(s).

Answer (a) [1]

(b) [1]

(c) [1]

- 9 Ferries to Port A and Port B depart from the same ferry terminal.
Ferry to Port B departs every 26 minutes while the ferry to Port A departs every 18 minutes.
If both ferries depart at 1324 hrs, state the next time that both ferries will depart from the same ferry terminal again.

Answer..... [3]

- 10 (a) Express 7056 as a product of its prime factors.
(b) Hence find the positive square root of 7056, leaving your answer in index notation.

Answer (a) $7056 = \dots\dots\dots$ [2]

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

- 11 (a) Solve $\frac{m}{2} + 3m \geq \frac{2}{5}$.

- (b) Hence write down the smallest integer value of m that satisfies $\frac{m}{2} + 3m \geq \frac{2}{5}$.

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

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

12 Solve

(a) $\frac{x+1}{3} = 15,$

(b) $5y + 12 = 18 - 3(y - 2).$

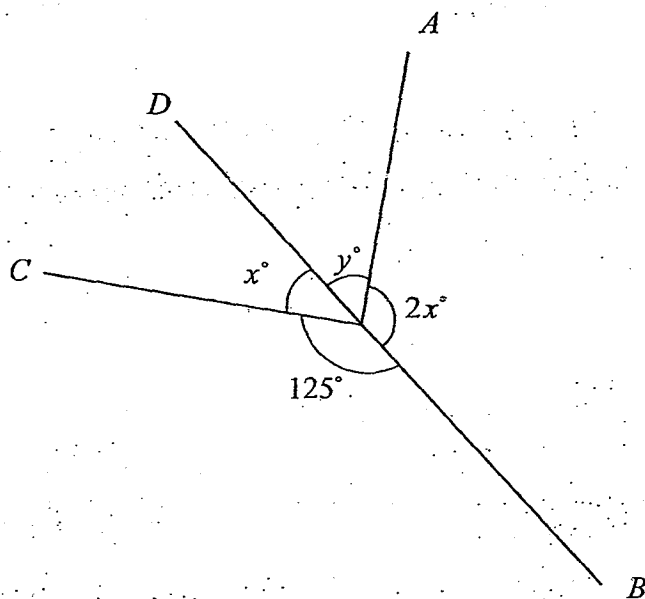
Answer (a) $x = \dots\dots\dots$ [1](b) $y = \dots\dots\dots$ [2]13 Given that $2 \leq x < 6$ and $-5 \leq y \leq -2$, and x and y are integers, find(a) the least possible value of $y - x$,(b) the least possible value of $\frac{x}{y}$;(c) the greatest possible value of $x^2 y^2$.Answer (a) $\dots\dots\dots$ [1](b) $\dots\dots\dots$ [1](c) $\dots\dots\dots$ [1]

14 (a) In the diagram, BD is a straight line.

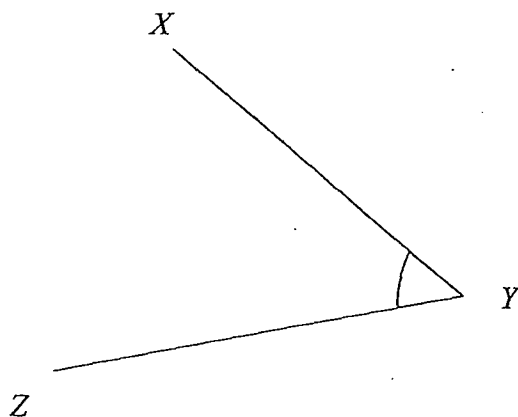
Find the value of

(i) x ,

(ii) y .



(b) Using a protractor, measure $\angle XYZ$.



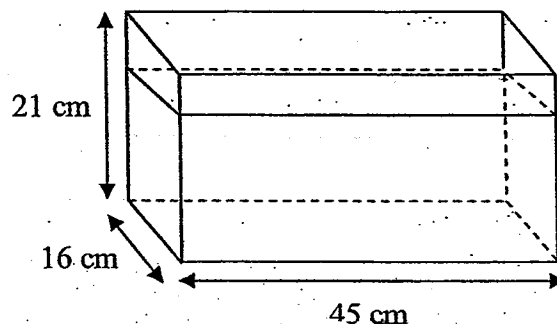
Answer (a)(i) $x = \dots\dots\dots$ [1]

(ii) $y = \dots\dots\dots$ [2]

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

- 15 The figure shows an open fish tank measuring 45 cm by 16 cm by 21 cm.

The tank is $\frac{6}{7}$ filled with water.



- (a) Find
- the height of water in the tank,
 - the volume of the water in the tank.
- (b) An additional amount of water is then poured into the tank.
- Calculate the volume of water that is required to fill the tank completely.
 - Water in the tank is now poured into glasses with a capacity of 600 ml each. Calculate the number of glasses that can be completely filled with water.

Answer (a)(i) cm [1]

(ii) cm³ [1]

(b)(i) cm³ [1]

(ii) glasses [2]

- 16 (a) Given a polynomial $5x - 12 + 3x^2$, state
- (i) the coefficient of x^2 ,
 - (ii) the constant term.
- (b) What polynomial must be added to $-p + 8q - 11$ to give $p + 6q - 3$?
- (c) Express the following statements algebraically, leaving your answer in its simplest form.
- (i) Add the square of a to the quotient of $51a^3$ divided by $3a$,
 - (ii) Subtract the square of w from the cube root of y .

Answer (a) (i) [1]

(ii) [1]

(b) [2]

(c) (i) [1]

(ii) [1]

17 (a) Simplify $4ab^2 - a(-3a)^2$.

(b) Given that $\frac{6x+4y}{-2y+4x} = \frac{4}{3}$, find the value of $\frac{y}{x}$.

(c) It is given that $h^2 = 3m - ef$.

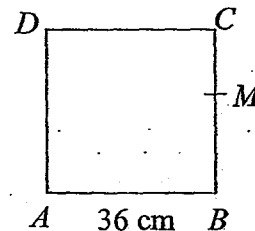
Find the value of m when $e = -7$, $f = 3$ and $h = -3$.

Answer (a) [1]

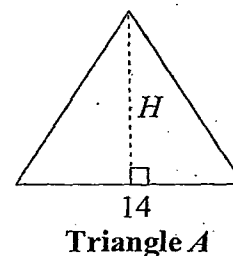
(b) $\frac{y}{x} =$ [3]

(c) $m =$ [2]

- 18 (a)(i) $ABCD$ is a square.
 $AB = 36$ cm.
 A point M is on the side BC where $BM : MC = 5 : 4$.
 Find the length of BM .



- (ii) Given that AM is 14% longer than AB , find the length of AM .
 Give your answer correct to the nearest whole number.
- (b)(i) Triangle A has a base length of 14 cm and a perpendicular height of H cm.
 Express the area of Triangle A in terms of H .
- (ii) Triangle B has a base length three times that of Triangle A and its perpendicular height twice that of Triangle A .
 Find the ratio of the area of the Triangle B to Triangle A .



Answer(a)(i)..... cm [2]

(ii)..... cm [1]

(b)(i) cm^2 [1]

(ii) : [2]

- End of paper -

One-page answers to 2014 Sec 1 Express Maths MYE P1

Qn	Answers	Qn	Answers
1a	120	14ai	$x = 55^\circ$
b	230 bulbs	14b	$\angle XYZ = 51^\circ$
2	1.31 (3 s.f.)	15ai	18 cm
3a	0.04 (nearest hundredth)	aii	Vol. of water in tank = 12960 cm^3
b	-128 (nearest integer)	15bi	Vol. of water required to fill the tank = 2160 cm^3
4	No. 343 can be divided by more than 2 factors (e.g. 7 and 49)	bii	No. of cups ≈ 25
5	$-\sqrt{\frac{43}{13}}, -1.8\dot{1}, -(1.346)^2, -1.8\dot{1}, -\frac{181}{1000}$	16ai	Coefficient of x^2 is 3
6	24 years old	aii	Constant term is -12
7a	18°C	b	$2p - 2q + 8$
b	26.5°C	ci	$18a^2$ (after simplification)
8a	$0, 1, \sqrt{121}, -\sqrt{25}$	cii	$\sqrt[3]{y} - w^2$
b	$\sqrt[3]{6}, \pi$	17a	$4ab^2 - 9a^3$
c	$\sqrt{121}$	b	$\frac{y}{x} = -\frac{1}{10}$
9	Required time will be at 17 18hrs or 5.18pm	c	$m = -4$
10a	$7056 = 2^4 \times 3^2 \times 7^2$	18ai	$BM = 20 \text{ cm}$
b	$2^2 \times 3 \times 7$	aii	$AM \approx 41 \text{ cm.}$
11a	$m \geq \frac{4}{35}$	18bi	$7H \text{ cm}^2$
11b	Smallest integer value is 1	bii	6 : 1
12a	$x = 44$		
b	$y = 1\frac{1}{2}$		
13a	-10		
b	-1		
c	625		

Marking Scheme for 2014 Sec 1 Express Maths MYE P1

Qn	Answers	Marks	Remarks
1a	$30 \div 25\% = 120$	B1	
b	$92\% \times 250 = 230$	B1	
2	$1.313655 \approx 1.31$ (3.s.f)	B2	Must approx. to 3 s.f.
3a	$0.0376 \approx 0.04$ (nearest hundredth)	B1	
b	-128 (nearest integer)	B1	
4	No. 343 can be divided by more than 2 factors (e.g. 7 and 49)	B2	No marks awarded for any answer without reasons
5	$-\sqrt{\frac{43}{13}}, -1.\dot{8}\dot{1}, -(1.346)^2, -1.\dot{8}\dot{1}, -\frac{181}{1000}$	B2	1 mark for 3 consecutive answers
6	HCF = 3 LCM (168) = $2^3 \times 7 \times 3$ Their ages are $2^3 \times 3$ and 7×3 i.e. 24 and 21 $\therefore$ Helen's age is 24.	M1 A1	Marks awarded for LCM of 168 Marks awarded for obtaining their ages using HCF and LCM
7a	18°C	B1	
b	$18.7^\circ\text{C} - (-7.8^\circ\text{C}) = 26.5^\circ\text{C}$	B2	1 mark for correct new boiling and freezing points.
8a	$0, 1, \sqrt{121}, -\sqrt{25}$	B1	
b	$\sqrt[3]{6}, \pi$	B1	
c	$\sqrt{121}$	B1	
9	$26 = 2 \times 13$ $18 = 2 \times 3^2$ LCM = $2 \times 3^2 \times 13$ = 234 mins 234 mins equivalent to 3h 54 min Required time will be at 17 18hrs or 5.18pm	M1 M1 A1	
10a	$7056 = 2^4 \times 3^2 \times 7^2$	B2	Marks awarded for factor tree method
b	$7056 = (2^2 \times 3 \times 7)^2$ $\therefore \sqrt{7056} = \sqrt{(2^2 \times 3 \times 7)^2}$ = $2^2 \times 3 \times 7$	B1	Must show working for mark to be awarded

11a	$\frac{m}{2} + 3m \geq \frac{2}{5}$ $\left(\frac{m}{2} \times 10\right) + (3m \times 10) \geq \frac{2}{5} \times 10$ $5m + 30m \geq 4$ $m \geq \frac{4}{35}$	M1 A1	Also accept $m \geq 0.114$ (3 s.f.)
11b	Smallest integer value is 1.	B1	(Note: $\frac{4}{35} = 0.1142857 \dots$)
12a	$\frac{x+1}{3} = 15$ $x+1 = 45$ $x = 44$	B1	
b	$5y + 12 = 18 - 3(y - 2)$ $5y + 12 = 18 - 3y + 6$ $8y = 24 - 12$ $y = \frac{12}{8}$ $y = 1\frac{1}{2} \quad \text{or} \quad y = 1.5$	M1 A1	1 mark awarded for correct expansion
13a	$x : 2, 3, 4, 5$ $y : -5, -4, -3, -2$ $\text{Least value } y - x = -5 - 5$ $= -10$	B1	
b	$\frac{x}{y} = \frac{5}{-2}$ $\text{Least value } y = -2.5$	B1	
c	$\text{Greatest value } x^2 y^2 = 5^2 (-5)^2$ $= 625$	B1	
14ai	$x + 125^\circ = 180^\circ \quad (\text{adj. } \angle \text{ on a st. line})$ $x = 55^\circ$	B1	
aii	$y + 2(55) = 180^\circ$ $y = 70^\circ$	M1 A1	
b	$\angle XYZ = 50^\circ (\pm 1^\circ)$	B1	
15ai	$\text{Height of water} = \frac{6}{7} \times 21$ $= 18 \text{ cm}$	B1	

aii	Vol. of water in tank = $45 \times 16 \times 18$ $= 12960 \text{ cm}^3$	B1	
15bi	Vol. of water required to fill the tank = $45 \times 16 \times 3$ $= 2160 \text{ cm}^3$	B1	
bii	No. of cups = $(12960 + 2160) \div 600$ $= 25.2$ ≈ 25	M1 A1	
16ai	Coefficient of x^2 is 3	B1	
aii	Constant term is -12	B1	
b	$(p + 6q - 3) - (-p + 8q - 11)$ $= 2p - 2q + 8$	M1 A1	Award 1 mark for correct order of subtraction of polynomials
ci	$\frac{51a^3}{3a} + a^2 = 18a^2$	B1	
cii	$\sqrt[3]{y} - w^2$	B1	
17a	$4ab^2 - a(3a)^2$ $= 4ab^2 - 9a^3$	B1	
b	$\frac{6x+4y}{-2y+4x} = \frac{4}{3}$ $18x+12y = -8y+16x$ $20y = -2x$ $\frac{y}{x} = -\frac{2}{10}$ $\therefore \frac{y}{x} = -\frac{1}{10}$	M2 A1	1 mark for correct expansion for each expression
c	$h^2 = 3m - ef$ $(-3)^2 = 3m - (-7)(3)$ $9 = 3m + 21$ $3m = -12$ $m = -4$	M1 A1	
18ai	9 units rep 36 cm 1 unit rep 4 cm 5 units rep 20 cm $\therefore BM = 20 \text{ cm}$	M1 A1	
aii	$AM = 114\% \times 36$ $= 41.04$ $\approx 41 \text{ cm. (nearest whole no.)}$	B1	

18bi	Area of triangle $= \frac{1}{2} \times 14 \times H$ $= 7H \text{ cm}^2$	B1	
bii	New area $= \frac{1}{2} \times (14 \times 3) \times (H \times 2)$ $= 42H \text{ cm}^2$ Ratio of new area : Original area $42H : 7H$ $6 : 1$	M1 A1	Award mark for area of triangle B
	Total marks	60	



聖嬰中學

HOLY INNOCENTS' HIGH SCHOOL

MID-YEAR EXAMINATION 2014
SECONDARY 1 EXPRESS

MATHEMATICS

4016/02

Paper 2

Name : _____

Date : 14 May 2014

Register No : _____

Duration : 1 h 30 min

Class : _____

Additional Materials: 4 sheets of Writing Paper

INSTRUCTIONS TO STUDENTS

Write your 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.

Calculators should be used 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, unless the question requires the answer in terms of π .

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

The total marks for this paper is 60.

Setter: Ms Nicole Goh

This paper consists of 8 printed pages, inclusive of this cover page.

Answer all the questions

- 1 Adam, Benjamin and Charlie worked at the same supermarket.
Each of them was paid \$4 per hour.
Adam worked for x number of hours.
Benjamin worked for 3 hours more than Adam.
Charlie worked twice as long as Benjamin.
- (a) Write down an expression, in terms of x , for
- (i) the number of hours for which Benjamin worked, [1]
 - (ii) the number of hours for which Charlie worked. [1]
- (b) Write down and simplify the expression, in terms of x , for the total number of hours Adam, Benjamin and Charlie spent on work. [2]
- (c) Given that a total of \$169 was paid to Adam, Benjamin and Charlie, form an equation in x , and solve the equation to find the number of hours that Benjamin had worked. [2]
- 2 (a) Mr Tan's weekly salary \$ A , is made up of a basic salary of \$50 and \$3.50 for every delivery he makes.
- (i) In a particular week, he made a total of 75 deliveries.
Calculate the salary he earned in that week. [1]
 - (ii) At the end of another week, he received \$372.
How many deliveries did he make? [2]
 - (iii) If he makes n deliveries in a week, write down the formula for A in terms of n . [1]
- (b) Mr Lim is given a basic salary of \$600 for the first 100 deliveries and \$1.50 for every subsequent delivery he makes.
Calculate who will earn more if each of them makes a total of 250 deliveries. [2]

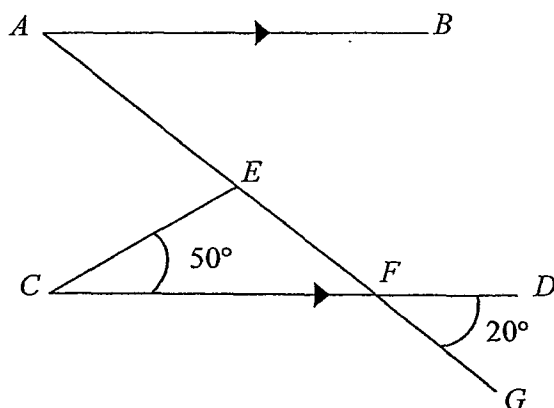
- 3 (a) Factorise completely $2ab^2 - 8ab$. [1]
- (b) Expand and simplify $8b(a - 2) - 4a(3 - b)$. [2]
- (c) Express $\frac{2x}{9} + \frac{2(x-1)}{3}$ as a single fraction. [3]
- 4 A man cycled from town A to town B at an average speed of 18 km/h for 90 minutes. He then travelled 6 km from town B to town C in 45 minutes.
- Find
- (a) the time he would reach town C if he left town A at 10 15, [1]
- (b) the distance he travelled from town A to town B, [2]
- (c) his average speed in his whole journey from town A to town C. [3]
- Give your answer in m/s, correct to three significant figures.

- 5 (a) In 2012, Mr Lim spent $\frac{1}{6}$ of his monthly income on rent, $\frac{1}{4}$ on food, and $\frac{1}{5}$ of the remainder on clothes. His monthly income is \$5400.
- (i) In any particular month, calculate the amount of money he spent on clothes, [2]
- (ii) calculate how much more money he spent on food than on rent. [2]
- (b) In 2013, Mr Lim's total expenditure on rent, food and clothes increased by 6%. If the rent remained the same, and the amount spent on food increased by 10%, express the increase in the amount spent on clothes as a percentage of the total expenditure in 2012. [3]

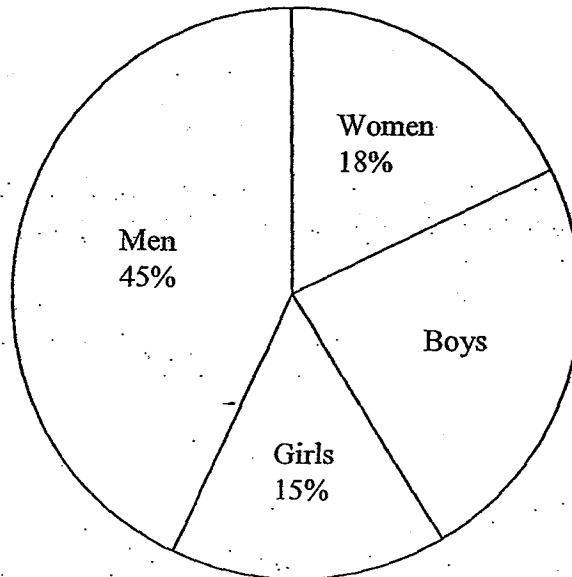
- 6 (a) In the figure below, $AEFG$ and CFD are straight lines and $AB \parallel CD$.
 $\angle ECF = 50^\circ$ and $\angle DFG = 20^\circ$.

Find

- (i) $\angle EFC$, [1]
- (ii) $\angle AEC$. [2]



- (b) The pie chart shows the distribution of participants in a marathon.



- (i) Find the ratio of the number of boys to the number of women taking part in the marathon. [1]
- (ii) There are 621 more men than boys.
Find the total number of men and boys participating in the marathon. [2]
- (iii) Calculate the angle of the sector representing the number of girls participating in the marathon. [1]

7 Consider the number patterns in the table below.

Line 1:	$3^2 - 2^2 = 5$
Line 2:	$4^2 - 3^2 = 7$
Line 3:	$5^2 - 4^2 = 9$
Line 4:	
⋮	
Line 7:	
⋮	
Line n :	$p^2 - q^2 = r$

- (a) Write down the pattern for Line 4 and Line 7. [2]
- (b) Write down an expression, in terms of n , for
- (i) p , [1]
 - (ii) q , [1]
 - (iii) r . [1]
- (c) Find the integer values of p and q when $r = 83$. [2]

- 8 (a) (i) When an ez-link card is scanned at the MRT gantry, the display shows the stored value in the ez-link card.

Justin used his ez-link card to travel on the MRT train from Orchard to Yishun Station.

At the Orchard station, the display showed \$1.45.

After he alighted at Yishun Station, the display showed – \$0.85.

How much did the ride cost? [2]

- (ii) At Yishun Station, Justin topped up his ez-link card with \$30.

What is the stored value of his card now? [1]

- (b) Tom and Jerry took part in a game whereby coloured balls are drawn from a bag. There are 5 blue balls, numbered 1 to 5, and 5 red balls, numbered 1 to 5, in the bag.

Drawing a blue ball leads to the deduction of points and drawing a red ball leads to gain of points. For example, if a blue ball with the number 5 on it is drawn, 5 points will be deducted and if a red ball with the number 4 is drawn, 4 points will be gained.

Tom and Jerry each took turns to draw a ball from the bag for 4 rounds and the balls are replaced in the bag after each draw.

The player with the most number of points wins the game.

- (i) Calculate the maximum and the minimum number of points a player can obtain. [2]

The table below represents the balls that were drawn by Tom and Jerry in the 4 rounds.

Round	1	2	3	4
Tom	Red, 3	Blue, 4	Red, 1	Red, 3
Jerry	Red, 4	Blue, 1	Red, 5	Blue, 2

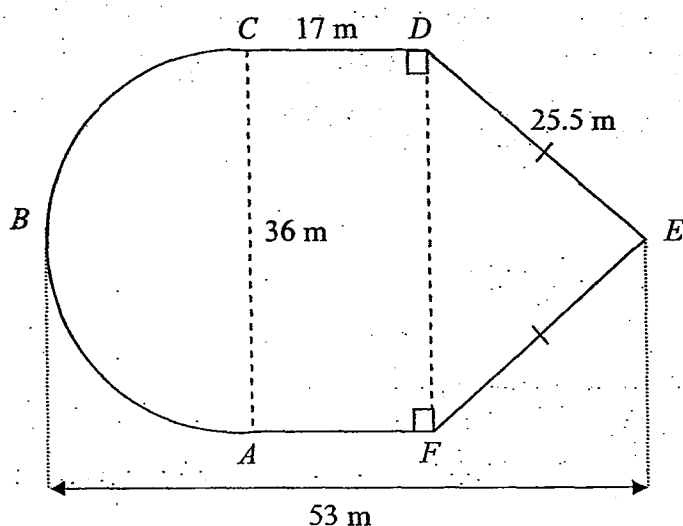
- (ii) Find the points obtained by Tom and Jerry respectively.

Who won the game? [2]

- 9 The figure below shows the floor plan of a function room in a hotel.

The function room is made up of a semi-circle ABC with diameter AC , a rectangle $ACDF$ and an isosceles triangle DEF .

$CA = 36$ m, $CD = 17$ m, $DE = EF = 25.5$ m and $BE = 53$ m.



[Take $\pi = 3.142$]

- (a) Calculate

- (i) the perimeter of the function room, [2]
- (ii) the area of the function room. [3]

- (b) (i) The entire floor of the function room is to be carpeted.
Calculate the cost of carpeting the entire function room if the price of the carpet is \$7.65 per square metre. [1]
- (ii) A goods and services tax (GST) of 7% is imposed on the total cost of carpeting the entire function room.
Find the total cost of carpeting the entire function room inclusive of GST. [2]

END OF PAPER

Sec 1 Express Mid-Year Exam 2014 Paper 2 Answer

1(a)(i) $x + 3$ (ii) $2(x + 3) = 2x + 6$ (b) $4x + 9$ (c) 11.3 hours	7(a) Line 4: $6^2 - 5^2 = 11$ Line 7: $9^2 - 8^2 = 17$ (b)(i) $p = n + 2$ (ii) $q = n + 1$ (iii) $r = n + 2 + n + 1 = 2n + 3$ (b) $p = 40 + 2 = 42$ $q = 40 + 1 = 41$
2(a)(i) \$312.50 (a)(ii) 92 deliveries (iii) $A = 50 + 3.50n$ (b) Mr Tan earns more	8(a) (i) \$2.30 (ii) \$29.15 (b)(i) Max = 20; Min = -20 (ii) Jerry won the game
3(a) $2ab(b - 4)$ (b) $12ab - 16b - 12a$ (c) $\frac{8x - 6}{9}$	9(a) 141.556m (b) $1445.004m^2$ (c) \$11054 (d) \$11828.08
4(a) 12 30 (b) 27 km (c) $14\frac{2}{3}$ km/h $= 4\frac{2}{27}$ m/s or 4.07m/s	
5(a)(i) \$630 (ii) \$450 (b) 1.3125%	
6(a) $\angle EFC = 20^\circ$, $\angle AEC = 70^\circ$ 6(b)(i) Boys : Women = 11 : 9 (ii) 1809 (iii) 54°	



聖嬰中學

HOLY INNOCENTS' HIGH SCHOOL

MID-YEAR EXAMINATION 2014
SECONDARY 1 EXPRESS

MATHEMATICS

4016/02

Paper 2 Marking Scheme

Name : _____

Date : 14 May 2014

Register No : _____

Duration : 1 h 30 min

Class : _____

Additional Materials: 4 sheets of Writing Paper

INSTRUCTIONS TO STUDENTS

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If working is needed for any question, it must be shown with the answer.
Omission of essential working will result in loss of marks.
Calculators should be used 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, unless the question requires the answer in terms of π .

The number of marks is given in brackets [] at the end of each question or part question.
The total marks for this paper is 60.

Setter: Ms Nicole Goh

This paper consists of 7 printed pages, inclusive of this cover page.

$$1(a) \text{ (i)} \quad x + 3 \dots\dots\dots B1$$

$$(ii) \quad 2(x + 3) = 2x + 6 \dots\dots\dots B1 \text{ (can accept } 2(x + 3))$$

$$(b) \quad x + x + 3 + 2(x + 3) \dots\dots\dots M1$$

$$= x + x + 3 + 2x + 6$$

$$= 4x + 9 \dots\dots\dots A1$$

$$(c) \quad 4(4x + 9) = 169 \dots\dots\dots M1$$

$$16x + 36 = 169$$

$$16x = 133$$

$$x = 8.3125$$

$$8.3125 + 3 = 11.3125 \text{ hours Benjamin worked } 11.3 \text{ hours} \dots\dots\dots A1$$

$$2(a)(i) \quad \$50 + \$3.50(75)$$

$$= \$312.50 \dots\dots\dots B1$$

$$(a)(ii) \quad \$372 - \$50 = \$322 \dots\dots\dots M1$$

$$\$322 \div \$3.50 = 92$$

$$\text{He made } 92 \text{ deliveries} \dots\dots\dots A1$$

$$(iii) \quad A = 50 + 3.50n \dots\dots\dots B1$$

$$(b) \quad \$600 + \$1.50(250 - 100)$$

$$= \$825$$

$$\text{Mr Lim earns } \$825$$

} M1

$$\$50 + \$3.50(250)$$

$$= \$925$$

$$\text{Mr Tan earns } \$925.$$

$$\text{Mr Tan earns more} \dots\dots\dots A1$$

$$3(a) \ 2ab(b-4) \dots\dots\dots B1$$

$$(b) \ 8b(a-2) - 4a(3-b)$$

$$= 8ab - 16b - 12a + 4ab \dots\dots\dots M1$$

$$= 12ab - 16b - 12a \dots\dots\dots A1$$

$$(c) \ \frac{2x}{9} + \frac{2(x-1)}{3}$$

$$= \frac{2x}{9} + \frac{2x-2}{3} \dots\dots\dots M1(\text{for expansion})$$

$$= \frac{2x}{9} + \frac{6x-6}{9} \dots\dots\dots M1(\text{for common denominator})$$

$$= \frac{8x-6}{9} \dots\dots\dots A1$$

$$4(a) \ 90 + 45 = 135 \text{ min} = 2 \text{ h } 15 \text{ min}$$

$$10 \text{ h } 15 \text{ min} + 2 \text{ h } 15 \text{ min} = 12 \text{ h } 30 \text{ min} \dots\dots\dots B1$$

$$(b) \ 18 \times \frac{90}{60} \dots\dots\dots M1$$

$$= 27 \text{ km} \dots\dots\dots A1$$

$$(c) \ (27+6) \div \frac{45+90}{60} \dots\dots\dots M1$$

$$= 33 \div \frac{135}{60}$$

$$= 14 \frac{2}{3} \text{ km/h} \dots\dots\dots A1$$

$$= 4 \frac{2}{27} \text{ m/s} \dots\dots\dots A1(\text{can accept } 4.07 \text{ m/s})$$

5(a)(i) $1 - \frac{1}{6} - \frac{1}{4} = \frac{7}{12}$ M1(find remainder)

$$\frac{1}{5} \times \frac{7}{12} = \frac{7}{60}$$

$$\frac{7}{60} \times \$5400 = \$630$$

He spent \$630 on clothes.....A1

(ii) Amount spent on rent = $\frac{1}{6} \times \$5400 = \900

Amount spent on food = $\frac{1}{4} \times \$5400 = \1350

} M1

Difference = $\$1350 - \$900 = \$450$

He spent \$450 more on food than on rent.....A1

(b) Total original amount spent = $\$630 + \$900 + \$1350 = \2880

Total new amount spent = $\frac{106}{100} \times \$2880 = \3052.80 M1

New amount spent on food = $\frac{110}{100} \times \$1350 = \1485

New amount spent on clothes = $\$3052.80 - \$1485 - \$900 = \667.80 M1

Percentage increase = $\frac{667.80 - 630}{2880} \times 100\% = 1.3125\%$ A1(accept $1\frac{5}{16}\%$)

$$6(a) \angle EFC = 20^\circ \dots\dots\dots B1$$

$$\angle CEF = 180^\circ - 20^\circ - 50^\circ \dots\dots\dots M1$$

$$= 110^\circ$$

$$\angle AEC = 180^\circ - 110^\circ \dots\dots\dots A1$$

$$= 70^\circ$$

$$6(b)(i) \text{ Boys} = 100\% - 18\% - 15\% - 45\% = 22\%$$

Boys : Women

$$22 : 18$$

$$11 : 9 \dots\dots\dots B1$$

$$(ii) 45\% - 22\% = 23\%$$

$$23\% \text{ rep } 621 \dots\dots\dots M1$$

$$1\% \text{ rep } 27$$

$$67\% \text{ rep } 1809$$

There are 1809 men and boys. A1

$$(iii) \frac{15}{100} \times 360^\circ$$

$$= 54^\circ \dots\dots\dots B1$$

$$7(a) \text{ Line 4: } 6^2 - 5^2 = 11 \dots\dots\dots B1$$

$$\text{Line 7: } 9^2 - 8^2 = 17 \dots\dots\dots B1$$

$$(b)(i) p = n + 2 \dots\dots\dots B1$$

$$(ii) q = n + 1 \dots\dots\dots B1$$

$$(iii) r = n + 2 + n + 1 = 2n + 3 \dots\dots\dots B1$$

$$(b) p + q = 83$$

$$2n + 3 = 83$$

$$2n = 80$$

$$n = 40$$

$$p = 40 + 2 = 42 \dots\dots\dots B1$$

$$q = 40 + 1 = 41 \dots\dots\dots B1$$

$$8(a) (i) \$1.45 - (-\$0.85) \dots\dots\dots M1$$

$$= \$2.30 \dots\dots\dots A1$$

$$(ii) -\$0.85 + \$30 = \$29.15 \dots\dots\dots B1$$

$$(b)(i) \text{ Max} = 5(4) = 20 \dots\dots\dots B1$$

$$\text{Min} = (-5)(4) = -20 \dots\dots\dots B1$$

(ii) Tom

$$= 3 - 4 + 1 + 3$$

$$= 3$$

Jerry

$$= 4 - 1 + 5 - 2$$

$$= 6$$

M1

Jerry won the game. A1

$$9(a) \text{ Perimeter} = \left(\frac{1}{2} \times 3.142 \times 36 \right) + 2(17) + 2(25.5) \dots\dots\dots M1(\text{correct formula for circle})$$

$$= 141.556 \text{ m} \dots\dots\dots A1$$

$$(b) \text{ Area} = \left(\frac{1}{2} \times 3.142 \times 18^2 \right) + (17 \times 36) + \left(\frac{1}{2} \times 36 \times 18 \right) \dots\dots\dots M2(\text{correct formula for circle and triangle})$$

$$= 1445.004 \text{ m}^2 \dots\dots\dots A1$$

$$(c) \text{ Cost of carpetting} = 1445.004 \times \$7.65$$

$$= \$11054.28$$

$$\approx \$11054 \dots\dots\dots B1$$

$$(d) \frac{107}{100} \times \$11054.28 \dots\dots\dots M1$$

$$= \$11828.08 \dots\dots\dots A1(\text{ans must be in 2 dp})$$