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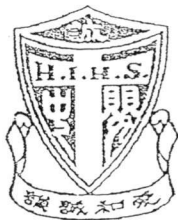
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聖嬰中學
HOLY INNOCENTS' HIGH SCHOOL

MID-YEAR EXAMINATION 2014
SECONDARY 1 NORMAL (ACADEMIC)

MATHEMATICS

4042/01

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

Answer [2]

2 "343 is a prime number".

State whether this statement is true or false. Give reasons for your answer.

Answer:
..... [2]

3 (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]

4 It is given that two numbers are $2^3 \times 3^2 \times 7$ and $2^3 \times 5^2 \times 29$.
Leaving your answers in index notation, find the

(a) HCF ,

(b) LCM.

Answer (a) HCF = [1]

(b) LCM = [1]

5 Given the list of numbers

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

write down

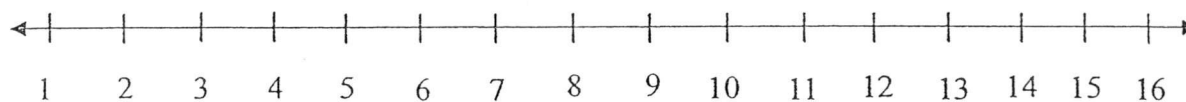
- (a) the integer(s),
- (b) the irrational numbers(s),
- (c) the prime number(s).

Answer (a) [1]

(b) [1]

(c) [1]

6 (a) Use dots “•” to label all the perfect square numbers on the number line below.



[1]

(b) Given that

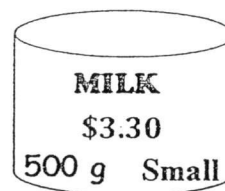
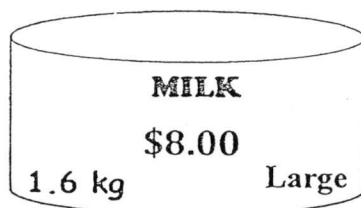
$$\frac{3}{4} \boxed{} 1\frac{7}{8} \boxed{} 4\frac{1}{6},$$

fill in the boxes with ‘×’ or ‘÷’ so that the calculation gives $1\frac{2}{3}$. [2]

- 7 At a bus interchange, Bus Service A leaves every 12 minutes, Bus Service B leaves every 21 minutes and Bus Service C leaves every 28 minutes. One bus from each service leaves the interchange at 08 00. At what time will buses from all three services next leave the bus interchange at the same time?

Answer [3]

8



Milk powder is sold in 2 tins of different sizes.
Using the information shown on the tins in the diagrams,

- (a) calculate the cost of 100 g of milk in the small tin,
(b) find which milk tin gives the better value.
Show your working clearly.

Answer (a) \$ [1]

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

- 9 The ages of two boys are 4 years 5 months and 7 years 9 months.

Find

- (a) the difference, in months, between the two ages,
(b) the average age of the two boys.

Answer (a)..... months [1]

(b) years months [2]

- 10 Mary wanted to buy x pears and twice as many mangoes.

Best Supermarket

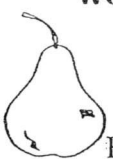


Pears @95 cents each



Mangoes @\$1.55 each

WOW Supermarket



Pears @80 cents each



Mangoes @\$1.30 each

Write down and simplify an expression, in terms of x , for

- (a) the amount of money needed, in dollars, if she shops at Best Supermarket,
(b) the amount of money saved, in dollars, if she shops at WOW Supermarket.

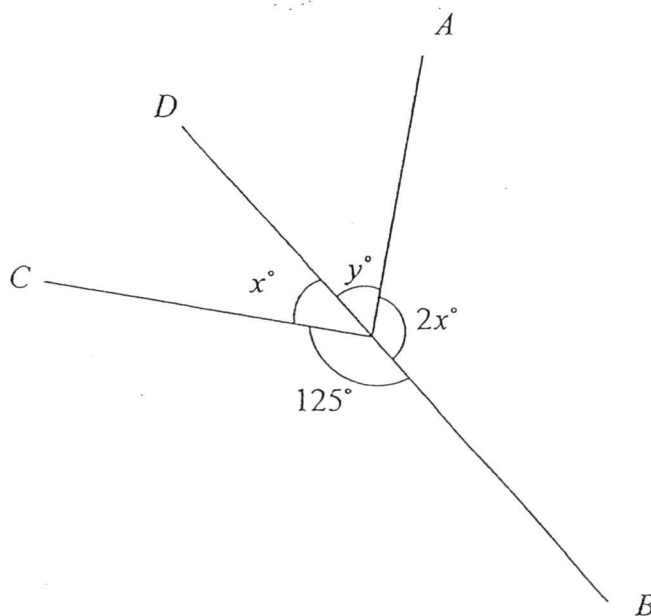
Answer (a)\$..... [1]

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

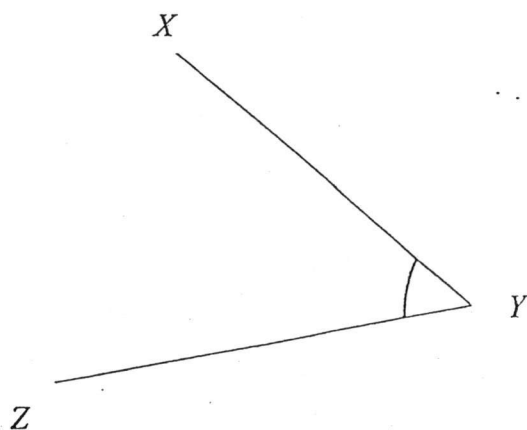
- 11 (a) In the diagram, BD is a straight line.

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]

12 (a) Given a polynomial $5x - 12 + 3x^2$, state

(i) the coefficient of x^2 ,

(ii) the constant term.

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

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

Answer (a)(i) [1]

(ii) [1]

(b) $m =$ [2]

13 Evaluate

(a) $(-2)^3 - (-11 + 3) + (-4)^2$,

(b) $6[(-13) + (-15) \times (-1)]$.

Show all workings clearly.

Answer (a) [2]

(b) [2]

- 14 The students and staff of Holy Secondary School took part in the school's annual cross country run.
45% of the participants were boys, 51% were girls and the rest were teachers.

If there were 612 girls, find

- (a) the number of boys,
(b) the number of teachers who took part.

Answer (a) boys [2]

(b) teachers [2]

- 15 (a) Express 301.855 and 598.223 correct to 1 significant figure.

(b) Use your answer in (a) to estimate the value of $\frac{(301.855)^2}{598.223}$.

- (c) Would your answer in (b) be different if you have expressed 301.855 and 598.223 correct to 2 significant figures instead? Give a reason for your answer.

Answer (a) $301.855 \approx$

$598.223 \approx$ [1]

(b) [1]

(c) [2]

16 Solve

(a) $6 = 0.2y,$

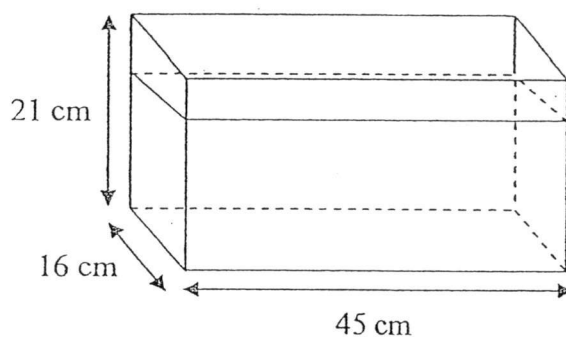
(b) $3 - \frac{4}{x} = 5,$

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

Answer (a) $y = \dots\dots\dots$ [1](b) $x = \dots\dots\dots$ [1](c) $y = \dots\dots\dots$ [2]

17 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
- (i) the height of water in the tank,
 - (ii) the volume of the water in the tank.
- (b) An additional amount of water is then poured into the tank.
- (i) Calculate the volume of water that is required to fill the tank completely.
 - (ii) 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) cm^3 [1]

(b)(i) cm^3 [1]

(ii) glasses [2]

18 Expressed as the product of its prime factors,

$$240 = 2^4 \times 3 \times 5.$$

- (a) Express 7056 as a product of prime factors.
- (b) Use your answer in (a) to find the positive square root of 7056, leaving your answer in index notation.
- (c) Find the smallest positive integer k for which $240k$ is a multiple of 7056.
- (d) Find the smallest positive integer n for which $\sqrt{240n}$ is a whole number.

Answer(a) 7056 = [1]

(b) $\sqrt{7056} =$ [1]

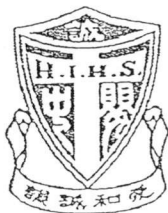
(c) [2]

(d) [1]

- End of paper -

One-page answers to 2014 Sec 1 N(A) Maths MYE P1

Qn	Answers	Qn	Answers
i	1.31(3 s.f.)	b	48
2	False. 343 can be divided by more than 2 factors (e.g. 7 and 49)	15a	300, 600.
3a	120	b	150
b	230	c	No. It would be the same. The answer would still be 300 and 600 after rounding off to 2 sig. fig.
4a,b	HCF = 2^3 LCM = $2^3 \times 3^2 \times 5^2 \times 7 \times 29$	16a	$y = 30$
5a	$0, 1, \sqrt{121}, -\sqrt{25}$	b	$x = -2$
b	$\sqrt[3]{6}, \pi$	c	$y = 1\frac{1}{2}$
c	$\sqrt{121}$	17ai	18 cm
6	Dot for 1, 4, 9 and 16	aii	12960 cm^3
b	$\frac{3}{4} \div 1\frac{7}{8} \times 4\frac{1}{6}$	17bi	2160 cm^3
7	The time will be 0924h or 9.24am	bii	No. of cups ≈ 25
8a	\$0.66	18ai	$7056 = 2^4 \times 3^2 \times 7^2$
b	large tin of milk gives a better value.	b	$2^2 \times 3 \times 7$
9a	40 months	c	$k = 147$
b	6 years 1 month	d	$n = 15$
10a	\$4.05x		
b	\$0.65x		
11ai	$x = 55^\circ$		
aii	$y = 70^\circ$		
b	$\angle XYZ = 50^\circ (\pm 1^\circ)$		
12ai	Coefficient of x^2 is 3		
aii	Constant term is -12		
b	$m = -4$		
13a	16		
b	12		
14a	540		



聖嬰中學
HOLY INNOCENTS' HIGH SCHOOL

MID-YEAR EXAMINATION 2014
SECONDARY 1 NORMAL(ACADEMIC)

MATHEMATICS

4042/02

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 50.

Setter: Ms Nicole Goh

This paper consists of 9 printed pages, inclusive of this cover page.

Answer all the questions

- 1 (a) Expand and simplify $8b(a - 2) - 4a(3 - b)$. [2]
- (b) Find the sum of $3x + 2y$ and $7x - 4y + z$. [2]
- 2 (a) A motorist travelled 44 km at an average speed of 80 km/h.
Calculate the time taken, in minutes, for this part of the journey. [1]
- (b) He then travelled at an average speed of 72 km/h for the next $2\frac{1}{2}$ h.
Calculate the distance travelled in this part of the journey. [1]
- (c) Calculate his average speed for the whole journey in km/h. [2]

- 3 Diagram I shows a rectangular candle with dimensions 6 cm by 3.5 cm by h cm. It has a volume of 378 cm^3 .

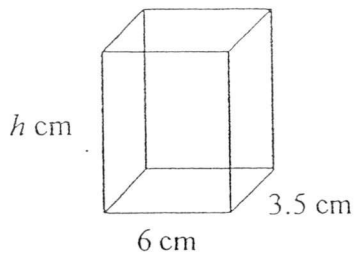


Diagram I: Candle

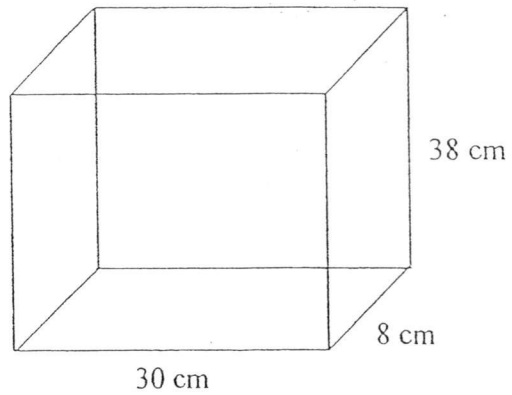


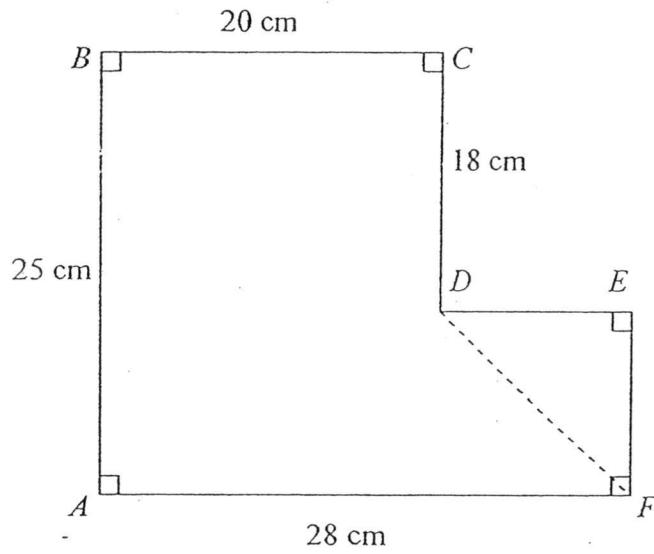
Diagram II: Box

- (a) Show that $h = 18 \text{ cm}$. [2]

- (b) Diagram II shows an open rectangular box with internal dimensions 30 cm by 8 cm by 38 cm.

If the candles are to be packed into the box in the upright position as shown in Diagram I, calculate the maximum number of candles that can be packed into the box.

[2]



- (a) Calculate the perimeter of the figure, $ABCDEF$. [1]
- (b) If triangle DEF was cut out from the figure, find the area of the remaining figure, $ABCDF$. [3]

- 5 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 \$196 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]

- 6 (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, his monthly income increased to \$6700.
- Express his new income as a percentage of his income in 2012, giving your answer correct to 2 decimal places. [2]

- 7 (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) In a quiz with 12 questions, each correct answer is awarded 3 marks, for each wrong answer, 2 marks are deducted and for each unanswered question, 1 mark is deducted.
- (i) Find the maximum score for the quiz. [1]
- (ii) Find the lowest possible score for the quiz. [1]
- (iii) Tammy sat for the quiz. She had 7 correct answers, 3 wrong answers and 2 questions left blank.
- How many marks did she score? [2]

- 8 Consider the number patterns in the table below.

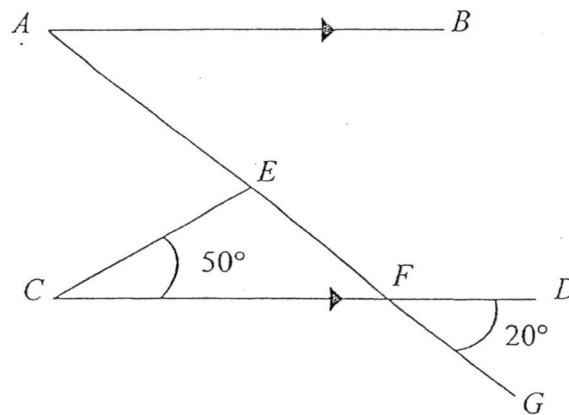
Line 1:	$3^2 - 2^2 = 5$
Line 2:	$4^2 - 3^2 = 7$
Line 3:	$5^2 - 4^2 = 9$
Line 4:	
⋮	
Line 7:	
⋮	
Line n :	$p^2 - q^2 = r$

- (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]

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

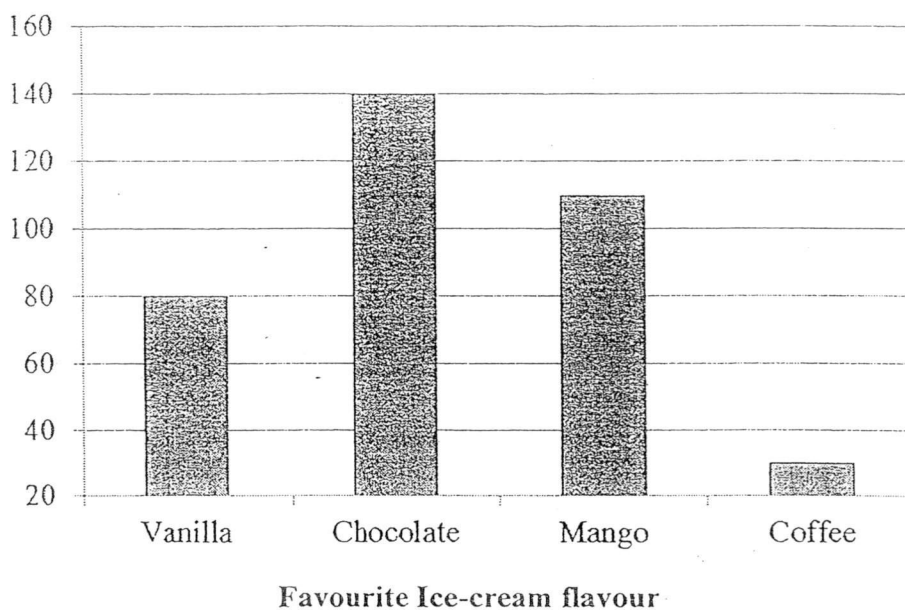
Find

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



- (b) The 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.

Number of students



- (i) How many more students prefer Mango flavour to Coffee flavour? [1]
- (ii) What fraction of the students choose Chocolate flavour as their favourite? [1]
- (iii) What percentage of the students did not choose Vanilla as their favourite flavour? [1]
- (iv) 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.
Do you agree with him?
Explain your answer. [2]

END OF PAPER

Sec 1 NA Mid-Year Exam 2014 Paper 2

1(a) $12ab - 16b - 12a$ (b) $10x - 2y + z$	8(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) $r = 2n + 3$ (b) $p = 42$; $q = 41$
2(a) 33min (b) 180km (c) 73.4 km/h or $73\frac{27}{61} \text{ km/h}$	9(a) $\angle EFC = 20^\circ$ $\angle AEC = 70^\circ$ (b)(i) $110 - 30 = 80$ (ii) $\frac{140}{360} = \frac{7}{18}$ (iii) $77\frac{7}{9}\%$ or 77.8% (iv) The number of students who prefer Chocolate is 140 instead of 160 . Hence Jamie is wrong to claim that the number of students who prefer Chocolate is twice the number of students who prefer Vanilla.
3(a) 18 cm (b) 20	
4(a) 106 cm (b) 528 units ²	
5(a)(i) $x + 3$ (ii) $2(x + 3) = 2x + 6$ (b) $4x + 9$ (c) 13 hours	
6(a)(i) \$630 (ii) \$450 (b) 124.07%	
7(a) (i) \$2.30 (ii) \$29.15 (b) (i) Max score = 36 (ii) Min score = -24 (iii) Tammy score = 13	