

Class	Index Number	Candidate Name
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**ANG MO KIO SECONDARY SCHOOL
MID-YEAR EXAMINATION 2017
SECONDARY ONE EXPRESS**

MATHEMATICS
Paper 1

4048/01

Tuesday

09 May 2017

1 Hour

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class 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, 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 .

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**.

For Examiner's Use
50

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

1 Consider the numbers below.

$$-3, 2.1\dot{6}, \sqrt{\frac{2}{7}}, 1\frac{1}{2}, \sqrt{25}$$

Write down the

(a) integer(s),

Answer (a) [1]

(b) prime number(s),

Answer (b) [1]

(c) irrational number(s).

Answer (c) [1]

2 (a) Express 704.3465 correct to

(i) 2 decimal places,

Answer (a)(i) [1]

(ii) 2 significant figures.

Answer (a)(ii) [1]

(b) Estimate, correct to 1 significant figure, the value of 5.9543×2.0496^2 .

Answer (b) [2]

- 3 (a) Express 756 as a product of its prime factors, giving your answer in index notation.

.....

Answer (a) [1]

- (b) Hence, find the smallest positive integer k such that $756k$ is a perfect cube.

Answer (b) $k =$ [1]

- 4 Write down the algebraic expression for each of the following statement.

- (a) Add 14 to the product of $3t$ and u ,

Answer (a) [1]

- (b) Subtract 7 from the cube of f ,

Answer (b) [1]

- (c) Divide the sum of k and m by $19y$.

Answer (c) [1]

- 5 (a) Express 1.80 kg as a percentage of 400 g.

.....

Answer (a) % [2]

- (b) Express 10 m/s in km/h.

Answer (b) km/h [2]

- 6 Given that $h = -2$, $m = 6$ and $n = -5$, evaluate

- (a) hmn ,

Answer (a) [1]

- (b) $3h^2 + m - n$.

Answer (b) [2]

- 7 Express the ratio of 2 minutes 15 seconds to 5 minutes in its lowest terms.

Answer : [2]

- 8 Simplify

(a) $5xy + [x + 2(xy - 1)]$,

Answer (a) [2]

(b) $\frac{3y-1}{4} - \frac{2+y}{3}$.

Answer (b) [3]

- 9 (a) A shop owner made a 20% loss when he sold a table for \$316. Find the cost price of the table.

.....

Answer (a) \$ [2]

- (b) A bank charges simple interest at 1.25% per annum for the money it lends out. Jane borrows \$15 000 from this bank. Find the interest she has to pay the bank at the end of 3 years.

Answer (b) \$ [2]

- 10 Mary can type an SMS message consisting of 150 words in 3 minutes 20 seconds.
Calculate

- (a) the number of words she can type in one minute,

Answer (a) words [2]

- (b) the time, in seconds, she uses to type 15 words.

Answer (b) seconds [2]

- 11 (a) Subtract $3x^2 + 5y$ from $x^2 - 8y$.

Answer (a) [2]

- (b) Factorise each of the following expressions completely

(i) $27a - 15b + 24c$,

Answer (bi) [1]

(ii) $12m^2n^3 - 18mn$.

Answer (b) [1]

- 12 Peter travelled 60 km at 40 km/h. He then rested for an hour before continuing his journey at 42 km/h for the next 2 hours.

Calculate

- (a) the time taken for the first part of the journey before his rest,

Answer (a) hours [1]

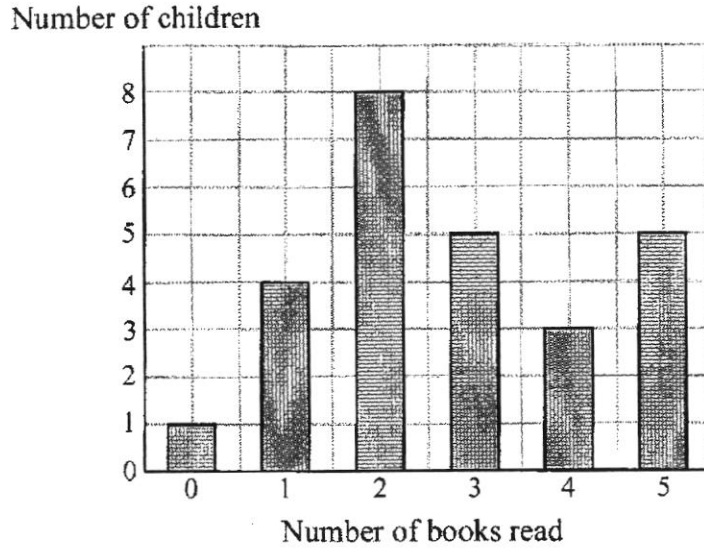
- (b) the distance travelled in the second part of the journey,

Answer (a) km [1]

- (c) his average speed for the whole journey.

Answer (c) km/h [2]

- 13 A group of 26 children were surveyed about the number of books they read in the month of March. The results of the survey are shown in the following bar chart.



- (a) Find the number of children who read more than 3 books in March.

Answer (a) children [1]

- (b) Find the average number of books read by the children in March.

Answer (a) books [2]

- (c) Calculate the percentage of children who read only 2 books in March.

Answer (c) % [2]

14 Mr Ong is travelling from Singapore to America for a holiday.

In Singapore, the exchange rate between the Singapore dollars (S\$) and the US dollars (US\$) is S\$1 = US\$0.715.

In America, the exchange rate is US\$1 = S\$1.35.

Mr Ong wants to change S\$700 into US dollars.

Should Mr Ong change his money in Singapore or America?

You must show your calculations.

Answer Mr Ong should change his money in
because [3]

END OF PAPER

Class	Index Number	Name
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**ANG MO KIO SECONDARY SCHOOL
MID-YEAR EXAMINATION 2017
SECONDARY ONE EXPRESS**

MATHEMATICS
Paper 2

4048/02

Wednesday

3 May 2017

1 hour 15 minutes

Additional Materials: Answer Paper

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, 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 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**.

Answer **all** the questions.

1 (a) Estimate, **without the use of a calculator**, the value of

$$\frac{4.03 \times \sqrt{99}}{(-2.016)^3} \quad [2]$$

(b) Find the value of $\frac{4.03 \times \sqrt{99}}{(-2.016)^3}$ using a calculator, leaving your answer correct to 2 decimal places. [1]

2 When written as the product of their prime factors,

$$360 = 2^3 \times 3^2 \times 5,$$

$$3024 = 2^4 \times 3^3 \times 7.$$

- (a) Find the lowest common multiple of 360 and 3024, leaving your answer in index notation form. [1]
- (b) Find the smallest positive integer p for which $360p$ is a multiple of 3024. [1]
- (c) Find the highest common factor of 360 and 3024. [1]
-

3 (a) Jane is x years old now.

Tim's present age is 2 years less than 3 times the present age of Jane.

Five years ago, Ken was twice Jane's age.

Write down an algebraic expression in x for

- (i) Tim's present age, [1]
- (ii) Ken's present age. [1]
- (b) During an IT fair, a computer monitor costs \$200 and a hard disk costs \$120. A company participating in the fair sold $3p$ computer monitors and $(p + 20)$ hard disks. Write down and simplify an algebraic expression for the amount, in dollars, that the company earned from the sale of these two items during the IT fair. [2]
-

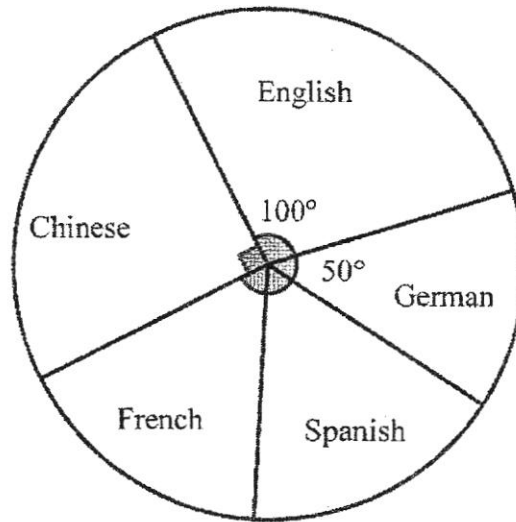
- 4 (a) John gives $\frac{1}{8}$ of his salary to his parents and spends $\frac{2}{3}$ of it.
He then saves the remaining amount.
- (i) Find the fraction of his salary that he saves. [2]
- (ii) Out of the total amount that John spends, $\frac{1}{4}$ was used on transportation.
If John earns \$2400, calculate the amount that he spends on transportation. [2]
- (b) Rose has three ribbons of lengths 160 cm, 192 cm and 240 cm. She wishes to cut cut all the ribbons into equal number of pieces without any leftover ribbons. Find the largest possible length of each piece of ribbon. [2]
-

- 5 (a) Given that $A : B = \frac{1}{2} : \frac{1}{3}$ and $B : C = 1 : 2$, find the ratio of $A : C$. [2]
- (b) Premium tea leaves costs \$8.90 per kg while normal tea leaves costs \$7.40 per kg.
A tea seller mixes premium tea leaves with normal tea leaves in the ratio 2: 3.
At what price, must he sell a mixture of 5kg to make a profit of 20%? [2]
- (c) The length of each side of a square is decreased by 20%.
Find the percentage decrease in the area of the square. [2]
-

6 Simplify the following expressions

- (a) $3x + 11 - 2x + 2$, [1]
- (b) $6(y - 2) - 9(4 - 2y)$, [2]
- (c) $3 + \frac{8 + w}{2} + \frac{3(2w - 1)}{5}$. [3]
-

- 7 The pie chart below shows the proportion of children of different mother tongues in an international school. There is an equal number of French and Spanish students. There are 45 students whose mother tongue is Chinese.



- (a) Find the total number of students in the school. [2]
- (b) Find the angle representing French as mother tongue. [1]
- (c) Express the number of students whose mother tongue is German as a fraction of the total number of students in the school. [1]

- 8 The price of a digital TV is \$7888 before 7% Goods and Services Tax (GST).
- (a) Crystal buys this digital TV on interest free hire purchase. What is the price of the digital TV after GST? [2]
 - (b) She pays a deposit of one quarter of the price after GST followed by 18 monthly instalments. Find the monthly instalment that Crystal has to pay. [2]
 - (c) The price of the digital TV includes a profit of 60% on the cost price. Calculate the cost price of the digital TV. [2]
-

- 9 Mary has a piece of string of length 240 cm, correct to the nearest 10 cm.
- (a) Write down
 - (i) the smallest possible length of the string, [1]
 - (ii) the largest possible length of the string. [1]
 - (b) Find the smallest possible area of a square formed by the string, giving your answer to the nearest square centimetres. [2]
-

- 10 (a) Mobile phone plans now come with data bundles which include a fixed monthly component and a variable component depending on the monthly usage. Two student mobile plans A and B offered by a company are shown in the table.

Student Mobile Plan	A	B
Monthly subscription	\$28	\$42
Free local incoming calls	Unlimited	
Free local outgoing calls *	150 min	100 min
Free local data bundle #	1 GB	4 GB
* If outgoing calls exceed the free minutes provided, excess usage is charged at \$0.02/second.		
# If data usage exceeds free data bundle provided, excess usage is charged at \$10/GB and capped at \$30 monthly.		

John makes 130 minutes of local outgoing calls and uses 3 GB of local data each month. Explain with the help of calculations which student price plan he should sign up for and why.

[4]

- (b) Mr Tan earned a total income of \$68 000 in 2016. Of this \$68 000, the amount that will not be subjected to income tax is as follows:

- Personal relief of \$3000,
- Wife relief of \$2000,
- \$1500 relief for each of his 4 children,
- CPF contributions of \$13600,
- Donations to charitable organisations of \$120.

- (i) Calculate his chargeable income.

[2]

- (ii) Given that the gross tax payable for the first \$40 000 is \$550 and the tax rate for the rest is 7%, find his income tax payable.

[2]

END OF PAPER

MID-YEAR EXAMINATION
 SECONDARY ONE EXPRESS
 MATHEMATICS PAPER 1

NO	SOLUTIONS	MARKS
1(a)	$-3, \sqrt{25}$	B1
1(b)	$\sqrt{25}$	B1
1(c)	$\sqrt{\frac{2}{7}}$	B1
2(a)(i)	704.35	B1
2(a)(ii)	700	B1
2(b)	6.0×2.0^2 $= 24$ $= 20$	M1 A1
3(a)	$756 = 2^2 \times 3^3 \times 7$	B1
3(b)	$2 \times 7^2 = 98$	B1
4(a)	$3tu + 14$	B1
4(b)	$f^3 - 7$	B1
4(c)	$\frac{k+m}{19y}$	B1
5(a)	$\frac{1800}{400} \times 100\%$ $= 450\%$	M1 A1
5(b)	1 s \rightarrow 10 m 3600 s \rightarrow 36000 m $= 36$ km 36 km/h	M1 A1
6(a)	60	B1
6(b)	$3(-2)^2 + 6 - (-5)$ $= 12 + 6 + 5$ $= 23$	M1 A1
7	135 seconds : 300 seconds $= 9 : 20$	M1 A1
8(a)	$5xy + [x + 2(xy - 1)]$ $= 5xy + x + 2xy - 2$ $= 7xy + x - 2$	M1 A1
8(b)	$\frac{3(3y-1) - 4(2+y)}{12}$ $= \frac{9y - 3 - 8 - 4y}{12}$ $= \frac{5y - 11}{12}$	M1 M1 A1

9(a)	$80\% \rightarrow \$316$ $100\% \rightarrow \frac{316}{80} \times 100$ $= \$395$	M1 A1
9(b)	$15000 \times \frac{1.25}{100} \times 3$ $= \$562.50$	M1 A1
10(a)	$\frac{150}{200} \times 60$ $= 45 \text{ words}$	M1 A1
10(b)	$\frac{200}{150} \times 15$ $= 20 \text{ seconds}$	M1 A1
11(a)	$x^2 - 8y - (3x^2 + 5y)$ $= x^2 - 8y - 3x^2 - 5y$ $= -2x^2 - 13y$	M1 A1
11(bi)	$3(9a - 5b + 8c)$	B1
11(bii)	$12m^2n^3 - 18mn = 6mn(2mn^2 - 3)$	B1
12(a)	$\frac{60}{40} = 1.5h$	B1
12(b)	84 km	B1
12(c)	$\frac{\text{Total dist}}{\text{Total time}} = \frac{60 + 84}{1.5 + 1 + 2}$ $= \frac{144}{4.5} = 32 \text{ km/h}$	M1 A1
13(a)	8	B1
13(b)	$\frac{0 + 4 + 16 + 15 + 12 + 25}{26}$ $= \frac{72}{26}$ $= 2.77 \text{ books}$	M1 A1
13(c)	$\frac{8}{26} \times 100\%$ $= 30.8\%$ OR $30\frac{10}{13}\%$	M1 A1
14	Singapore: $700 \times 0.715 = \text{US\$}500.50$ America: $700 \div 1.35 = \text{US\$}518.52$ America US\$18.02	M1 B1 B1

1E MID YEAR EXAM PAPER 2 SOLUTIONS

NO	SOLUTIONS	MARKS	REMARKS
1(a)	$\frac{4.03 \times \sqrt{99}}{(-2.016)^3} \approx \frac{4 \times \sqrt{100}}{(-2)^3}$ $= -5$	M1 A1	
1(b)	-4.89	B1	
2(a)	LCM = $2^4 \times 3^3 \times 5 \times 7$	B1	
2(b)	42	B1	
2(c)	HCF = 72	B1	
3(ai)	(3x - 2) years old	B1	
3(aii)	2(x - 5) + 5 years old	B1	
3(b)	Amount earned = $200(3p) + 120(p + 20)$ $= 600p + 120p + 2400$ $= \$(720p + 2400)$	M1 A1	
4(ai)	$1 - \frac{1}{8} - \frac{2}{3}$ $= \frac{5}{24}$	M1 A1	
4(aii)	$\frac{2}{3} \times \frac{1}{4}$ $= \frac{1}{6}$ $\frac{1}{6} \times 2400$ $= 400$	M1 A1	
4(bi)	HCF = 2^4 $= 16$	M1 A1	
5(a)	A : B $\frac{1}{2} : \frac{1}{3}$ 3 : 2 B : C 1 : 2 2 : 4 A : C 3 : 4	M1 A1	
5(b)	Cost price = $8.90 \times 2 + 7.40 \times 3$ $= \$40$ Selling price = $\frac{120}{100} \times 40$ $= \$48$	M1 A1	
5(c)	Orig length = x cm New length = 0.8x cm Orig area = x^2		

	$\text{New area} = (0.8x)^2$ $= 0.64x^2$ $\% \text{ decrease} = \frac{x^2 - 0.64x^2}{x^2} \times 100$ $= 36\%$	M1 A1	
6(a)	$3x + 11 - 2x + 2$ $= 3x - 2x + 2 + 11$ $= x + 13$	B1	
6(b)	$6(y-2) - 9(4-2y)$ $= 6y - 12 - 36 + 18y$ $= 24y - 48$	M1 A1	
6(c)	$3 + \frac{8+w}{2} + \frac{3(2w-1)}{5}$ $= \frac{30 + 5(8+w) + 6(2w-1)}{10}$ $= \frac{30 + 40 + 5w + 12w - 6}{10}$ $= \frac{17w + 64}{10}$	M1 M1 A1	
7(a)	$90^\circ \text{ ----- } 45 \text{ students}$ $360^\circ \text{ ----- } \frac{360 \times 45}{90}$ $= 180 \text{ students}$	M1 A1	
7(b)	$360 - 90^\circ + 100^\circ + 50^\circ = 120^\circ$ $120 \div 2 = 60^\circ$	B1	
7(c)	$\frac{50}{360}$ $= \frac{5}{36}$	B1	
8(a)	$\text{Price} = 7888 \times 1.07$ $= \$8440.16$	M1 A1	
8(b)	$\text{Monthly instalment} = \left(8440.16 \times \frac{3}{4} \right) \div 18$ $= \$351.67$	M1 A1	
8(c)	$\text{Amount paid} = \frac{7888}{160} \times 100$ $= \$4930$	M1 A1	
9(ai)	235	B1	
9(aii)	244	B1	
9(b)	$235 \div 4 = 58.75$ $58.75^2 = 3452 \text{cm}^2$	M1 A1	

10(a)	<p>Amount John pays on student price plan A $= 28 + 10 \times 2$ $= \\$ 48$</p> <p>Amount John pays on student price plan B $= 42 + (130 - 100) \times 60 \times 0.02$ $= 42 + 36$ $= \\$78$</p> <p>John should sign up for student price plan A. He pays less for his phone bill with this plan.</p>	<p>M1</p> <p>M1</p> <p>A1</p> <p>A1</p>	
10(bi)	$\$68000 - \$13600 - \$120 - \$3000 - \$2000 - 4(\$1500)$ $= \$43280$	<p>M1</p> <p>A1</p>	
10(bii)	$\frac{7}{100} \times \$4280 = \229.60 $\$550 + \$229.60 = \$779.60$	<p>M1</p> <p>A1</p>	