Name: Index No:



## Anglo-Chinese School (Barker Road)

**PRELIMINARY EXAMINATION 2020** 

SECONDARY FOUR EXPRESS / FIVE NORMAL (ACADEMIC)

## MATHEMATICS 4048 PAPER 1

2 HOURS

Candidates answer on the Question Paper.

#### **READ THESE INSTRUCTIONS FIRST**

Write your index number and name 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 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 your answer to three significant figures. Give answers in degrees to one decimal place.

For  $\pi$ , use either your calculator value or 3.142, unless the question requires the answer in terms of  $\pi$ .

At the end of the examinations, fasten 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 80.

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1		

This document consists of 22 printed pages.

#### Mathematical Formulae

Compound Interest

Total amount = 
$$P\left(1 + \frac{r}{100}\right)^{n}$$

Mensuration

Curved Surface area of cone =  $\pi rl$ 

Surface area of a sphere =  $4\pi r^2$ 

Volume of a cone = 
$$\frac{1}{3}\pi r^2 h$$

Volume of a sphere = 
$$\frac{4}{3}\pi r^3$$

Area of a triangle = 
$$\frac{1}{2}ab\sin C$$

Arc length =  $r\theta$ , where  $\theta$  is in radians

Sector area 
$$=\frac{1}{2}r^2\theta$$
, where  $\theta$  is in radians

Trigonometry

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

Statistics

$$Mean = \frac{\sum fx}{\sum f}$$

Standard deviation = 
$$\sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$$

## Answer all the questions.

Examiner's Use Solve 5(x+3) = 2x+9. [2] Answer (a) The sets X and Y are shown on the Venn diagram below. 2 The element g is such that  $g \in X$  and  $g \notin Y$ . On the diagram, write g in the correct region. [1] Answer (b) On the Venn diagram below, shade the region  $A \cup B$ [1] Answer

	-: := =:		
3	The	first four terms of the sequence are 5, 13, 21 and 29.	
المادات والمدادة والم	(a)	Write down an expression, in terms of $n$ , for the $n$ th term.	out observed the
		Answer (a)	[1]
AND GOLD AND A SECTION OF THE ANALYSIS AND A	(b)	Explain why 199 cannot be a term of this sequence.	
		Answer (b)	[1]
		estinger for est conservation of the first expensive established and established established established to be the conservation of the conservatio	
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		destroyed by the first of the f	
4	On	a map, a garden is represented by an area of 375 cm <sup>2</sup> .	
4	Giv		· · · · · · · · · · · · · · · · · · ·
4	Giv	a map, a garden is represented by an area of 375 cm <sup>2</sup> .  ven that the actual area is 15 km <sup>2</sup> and that the map is draw to scale	
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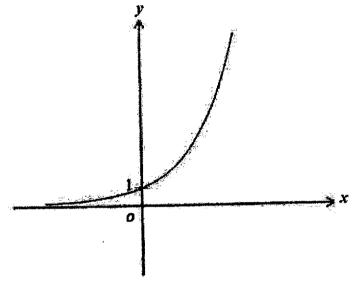
Far I ханирет s (/se T varies inversely with the square of x. The value of T is 36 units for a particular value of x. Find the value of T if x is increased by 200%. Answer In the figure below, QU is parallel to RT, QS is parallel to PT and Q is the midpoint of PR. Prove that triangle QUP is congruent to triangle RSQ. [2] Answer Mittel bereit bei bereit berei

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For Examiner's Use

7 The diagram shows a sketch of  $y = \frac{1}{2}a^{x+1}$ , where a is a constant. The graph passes through the points (0,1) and (q,8). For Examiner's The



Find the value of a and q.

Answer

$$q =$$

[2]

8	Elsa shared that the mean, median and mode of 5 numbers are 20.	
	The range of these five numbers is 18.	
	The greatest number is 27.	
	Find the five numbers and write them in increasing order.	
	,	
		[n]
	Answer	[2]
9	k is a positive integer.	
	Show that, for all values of $k$ , $(2k+1)^2 - 1$ is a multiple of 4.	
		ro:
	Answer	[2]
	.#T	

1		The state of the s	Εz
10	(a)	Express $\sqrt{8}$ as a power of 2.	
		Answer (a)	<i>:</i>
	(b)	Given that $5^3 \div 5^{-x} = 1$ , find the value of x.	
			William Control of the Control of th
A THE REAL PROPERTY OF THE PERSON NAMED IN COLUMN TO THE PERSON NA		Answer (b) $x = $ [2]	Name and Address of the Party o
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4		• • •	1
		ctorise the following completely: $7ab^2 - ab$	The state of the s
			a in this limit is
			A STATE OF THE COLUMN STATE OF THE STATE OF
	(a)	$7ab^2 - ab$	And the state of t
	(a)	$7ab^2 - ab$ Answer (a)[1]	THE PARTY OF THE P
	(a)	$7ab^2 - ab$ Answer (a)[1]	THE REPORT OF THE PROPERTY OF
	(a)	$7ab^2 - ab$ Answer (a)[1]	

Examples is that (12) (a) Solve the inequality  $x+2 \le 2x+1 < 5$ .

.

For Examiner's (ise

Answer (a)

(b) Illustrate your answer in (a) on the number line below.

Answer (b)

[1]



13 Given that  $A = \sqrt{\frac{x}{x_0 - x}}$ , express x in terms of A and n.

Inswer X = [3]

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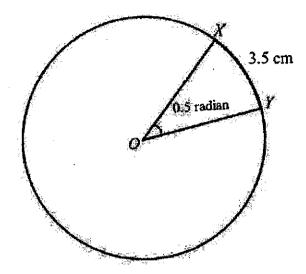
Secondary 4 Express/Five Normal (Academic) Mathematics Syllubus 4048 Paper I

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14	······································	-
	Desmond invests \$30000 in a savings account with compound interest $x\%$ per annum.	
	After 2 years, the balance in the account is \$31800.	
	Find the value of $x$ .	
	Answer $x = \frac{1}{10000000000000000000000000000000000$	3]
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	£ 1	
	3 , I	
15	Write as a single fraction in its simplest form $\frac{3}{1-x} + \frac{1}{x^2-1}$	
15	Write as a single fraction in its simplest form $\frac{5}{1-x} + \frac{1}{x^2-1}$	
15	Write as a single fraction in its simplest form $\frac{3}{1-x} + \frac{1}{x^2-1}$ .	
15	Write as a single fraction in its simplest form $\frac{3}{1-x} + \frac{1}{x^2-1}$ .	
15	Write as a single fraction in its simplest form $\frac{5}{1-x} + \frac{1}{x^2-1} = \frac{1}{x^2-1}$	
15	Write as a single fraction in its simplest form $\frac{3}{1-x} + \frac{1}{x^2-1} = \frac{3}{x^2-1}$	
15	Write as a single fraction in its simplest form $\frac{3}{1-x} + \frac{1}{x^2-1}$	
15		
15		
15		
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15		

For Kraminer's Vise

In the diagram below, O is the centre of the circle. The arc length of the circle is 3.5 cm.



(a) Find the radius of the circle, OX.

(b) Find the area of major sector XOY, leaving your answer in terms of  $\pi$ .

Answer (b)

Preliminary Examination 2020

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			T
17	(a)	Express 4410 as a product of its prime factors.	Exam.
* /	(4)	LAPIGOS (110 as a productive f	materiory prints
			A CONTRACTOR OF THE PARTY OF TH
		Answer (a) $4410 = $ [1]	
	(b)	Find the smallest integer $p$ such that 4410 $p$ is a perfect square.	-
-			
and the state of t			
			1
		Answer (b) $p = [1]$	]
The state of the s	(e)		and the second s
2 11 2	(-)	Find the greatest positive integer that will divide 4410 and 1050	25.
		•	
			The state of the s
1			
		(b)	Answer (a) $4410 = 100$ [1]  (b) Find the smallest integer $p$ such that $4410p$ is a perfect square.  Answer (b) $p = 100$ [1]  (c) Written as a product of its prime factors, $1050 = 2 \times 3 \times 5^2 \times 7$ .

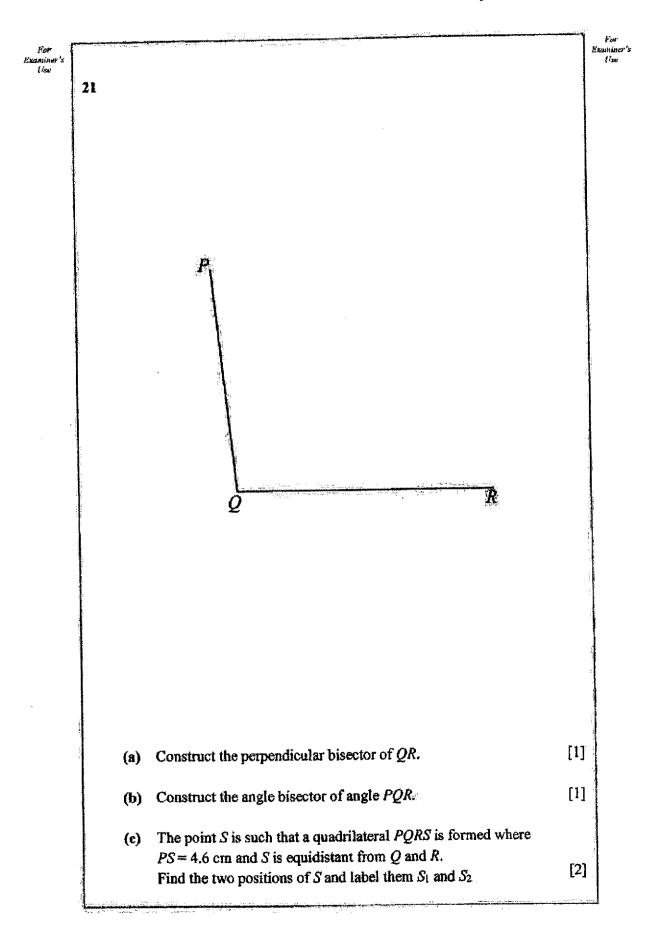
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i8 (a)	The ratio of an interior angle to an exterior angle of a n-sided regular polygon is 4: 1.
	Find the value of $n$ .
	•
	Answer (a) n=
<b>(b</b> )	Explain briefly why the interior angle of a regular polygon cannot be 130°.
	Answer (b)

19	Identical cans in the form of open cylinders are of radius 6 cm and
	height 10 cm.
	A tank is filled with 12.96 litres of water to the brim.
	If the water in the tank is used to fill up as many cans as possible,
	<ul> <li>(a) the maximum possible number of cans that can be completely filled,</li> </ul>
The state of the s	
	Answer (a) [3]
Constitution of the consti	(b) the amount of remaining water in the tank.
į.	
8. VIII.	

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In the diagram, ABCD is a piece of plastic with angle  $ACB = 90^{\circ}$ , AB = 85 cm, BC = 84 cm, AD = 5 cm and CD = 12 cm. 84 Find angle \( \angle ABC \) [2] Answer (a) garenis kantaroparaturekeniantekteniantekt. (b) Show that triangle ADC is a right-angled triangle. [2] Answer (b)



A SECULIAR OF A

22 (a) An ice cream company conducts a survey on a total number of 300 students in a primary school to find out which flavour is the least popular and most popular.

The pie chart represents the number of votes for each flavour.



Explain why this pie chart is not useful to present the survey results.

Answer (a)

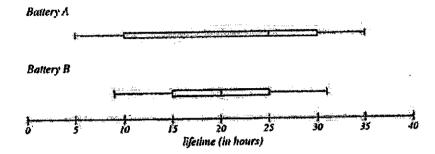
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[1]

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For Examiner's

b) The box-and-whisker plot shows the distribution of the lifetime of Battery A and B. Fur Examiner's Use



(i) Provide a reason why someone might prefer Battery A.

Answer (b)(i)

Answer (b)(ii)

innerentario de la constitución de

(ii) Provide two reasons why someone might prefer Battery B.

Sketch the graph y = -(x+3)(x-1), indicating clearly the value 23 (a) where the graph crosses the x- and y-axes. [3] Answer (a) (b) Write down the equation of the line of symmetry of the graph y = -(x+3)(x-1). Answer (b) Using the diagram in part (a), find the range of values of q for which the line, y = q would intersect y = -(x+3)(x-1) exactly two times.

For Examiner's	T		For Exuntaer's Use
1/5#	24	A line I passes through the points $B(-6,2)$ and $C(-14,4)$ .	
		(a) Find the length of BC.	
	V.		
	Marie II.		- may -
	(Action Open service)	Answer (a) units [2]	
		Another line z passes through the point $(-10,0)$ and has the same	
		gradient as line l.	
		(b) Find the equation of the line z.	
			in .
	Your Control		
	· · · · · · · · · · · · · · · · · · ·		
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	11 12 12 12 12 12 12 12 12 12 12 12 12 1		
	i de la companya de l		And the second second
	:·o.	Answer (b)	]
		Answer (b) [3	

fin humacrk			Example of S Esse
: = 0.7 TH COMMISSION	25	Three similar bottles A, B and C have heights in the ratio 5: 3: 2.  (a) Find the height of bottle C if the height of bottle A is 12cm.	
<b>M</b> y an analogue and a second			
ang a	9		
		Answer (a) cm [1]	
		SANCTOR AND	
# 077 min of 100 min o		The bottles are filled with cooking oil.  Bottle A is priced at \$25, bottle B at \$10 and bottle C at \$8.50.	ora e mande de d
		(b) Which is the best value for money? Show your workings clearly.	. n nv vu mántón delen
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	WINDS AND		
		Answer (b) [3]	nest property and the second
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For Examiner's Use

26 (a) In 2018, Julie was paid a salary of \$108000 per annum.

This salary was an increase of 20% of her salary in 2016.

Calculate her salary per annum in 2016.

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Answer (a) \$ [2]

(b) The table below shows the income tax rate in 2018.

Chargeable Income	Income Tax Rate (%)	Gross Tax Payable (\$)
First \$20,000	0	0
Next \$10,000	2	200
First \$30,000	The second secon	200
Next \$10,000	3.50	350
First \$40,000		550
Next \$40,000	7	2800

Given that Julie received a total of \$46750 tax reliefs, calculate the amount of income tax she had to pay in 2018.

wer (b) \$

[3]

**End of Paper** 

Name:	Index No:



**PRELIMINARY EXAMINATIONS 2020** 

## SECONDARY FOUR EXPRESS/ FIVE NORMAL (ACADEMIC)

## MATHEMATICS 4048 PAPER TWO

2 hours 30 minutes

Candidates answer on the Question Paper.

#### **READ THESE INSTRUCTIONS FIRST**

Write your index number and name 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 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 your answer to three significant figures. Give answers in degrees to one decimal place.

For  $\pi$ , use either your calculator value or 3.142, unless the question requires the answer

in terms of  $\pi_{i}$ 

At the end of the examinations, fasten 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 100.

#### Mathematical Formulae

Compound Interest

Total amount = 
$$P\left(1 + \frac{r}{100}\right)^{t}$$

Mensuration

Curved Surface area of cone =  $\pi rl$ 

Surface area of a sphere =  $4\pi r^2$ 

Volume of a cone = 
$$\frac{1}{3}\pi r^2 h$$

Volume of a sphere = 
$$\frac{4}{3}\pi r^3$$

Area of a triangle = 
$$\frac{1}{2}ab\sin C$$

Arc length  $= r\theta$ , where  $\theta$  is in radians

Sector area =  $\frac{1}{2}r^2\theta$ , where  $\theta$  is in radians

Trigonometry

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

Statistics

$$Mean = \frac{\sum fx}{\sum f}$$

Standard deviation = 
$$\sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$$

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### Answer all the questions

The graph below shows a cumulative frequency curve showing the daily pocket money of 350 secondary pupils. Number of students Amount (in dollars) Use the graph to estimate the largest amount of pocket money received by a student, Answer (a) \$ [1] the median pocket money, (b) Answer (b) \$ [1] the 60th percentile, (c) the number of students whose pocket money is more than \$5.50. **(d)** Answer (d) [2]

2	When She t	warehouse sale, Sherry paid \$400 for x number of surgical masks, a she returned home, she kept 50 of them for her own personal use hen went online and sold the rest of the masks, making a profit of on each mask.  Write down, in terms of x, for  (i) the amount of money that Sherry paid for each mask, and
ŠVATALINISTA I TRANSPORTINISTA I POPULINISTA		Answer (a)(i) \$ [  (ii) the price at which she sold each mask.
		Answer (a)(ii) \$
	(b)	After seiling all the surgical masks, she found that she made \$290 in sales. Form an equation in x and simplify it to $13x^2 - 25900x - 200000 = 0.$ Answer (b)

Mariant S	(c)	Solve the equation $13x^2 - 25900x - 200000 = 0$	Fi Exam (4
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AND THE PERSON NAMED IN COLUMN			
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			in the second se
		(2)	י ז
And a second sec		Answer (c) $x = 0$ or [3]	
	(d)	Explain why one of the answers in (c) has to be rejected.	
			THE PERSON NAMED IN
Waterproduction and the Mark		Answer (d)	
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For Examinar

3 A rice distributor supplies Thai rice to two minimarts at two locations, Balmoral Plaza and Chancery Esquire.

The rice are packed in bags of 3 kg, 5 kg and 10 kg.

The sales for month of January and February are given in the table below.

	January February					
	3 kg	5 kg	10 kg	3 kg	5 kg	10 kg
Balmoral Plaza	10	43	35	13	37	41
Chancery Esquire	[2]	32	21	11	45	48

The information for the January's sales can be represented by matrix  $A = \begin{pmatrix} 10 & 43 & 35 \\ 12 & 32 & 21 \end{pmatrix}$ . The information for February is represented by matrix **B**.

(a) Write down matrix B.

Answer (a) 
$$B = [1]$$

(b) Calculate  $\frac{1}{2}(A+B)$ 

(e) Describe, in words, what is represented by  $\frac{1}{2}(A+B)$ 

[1]

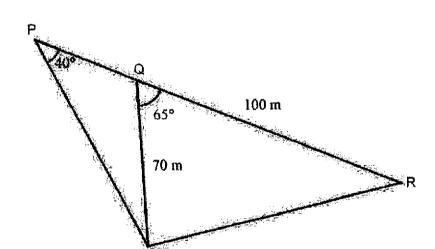
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Using matrix multiplication, find the total weight of Thai rice supplied to each minimart in January.

Answer

State a matrix N such that when N is multiplied to the matrix A, (e) the answer will give you the total number of bags of rice supplied to Balmoral Plaza and Chancery Esquire respectively in the month of January.

Answer



The diagram shows the cycling path PQRS of a park. Angle  $SQR = 65^{\circ}$ , Angle  $SPR = 40^{\circ}$ , QS = 70 m and QR = 100 m.

Calculate the length of PQ.

Answer (a) [3]

(b) Calculate the length of RS.	negopologica.	Examiner's Line
	**************************************	
Answer	(b) <u>m</u> [3]	
(c) Calculate the area of triangle QR	25.	
		÷
Answer	(c) m <sup>2</sup> [2]	
(d) A tree of height 50 m is at point Calculate the greatest angle of el when viewed by Kai.	Q. Kai is walking along SR. evation of the top of the tree	
The state of the s		
	Consideration of the constant	
	The state of the s	
Answer	(d)	

	(e)	Given that the bearing of S from P is $150^{\circ}$ , find the bearing of S from Q.	English II.
A THE PROPERTY OF THE PROPERTY		•	
	and the second second	Answer (e) 0 [2]	
5	(a)	Find the total surface area of the figure shown below.	
		6 cm 5 cm	
WEINERSTEIN		5 cm	
anii ti quati affilia a da a		15 cm	A 11 - 14 - 14 - 14 - 14 - 14 - 14 - 14
			- Hard
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A THE STATE OF THE			Manager Administra
A.		Answer (a) $cm^2$ [3]	

(b) In the diagram, ABCD and BPQR are two rhombuses. If angle  $PQR = 118^{\circ}$  and angle  $ADR = 104^{\circ}$ , calculate, angle QPR, **(i)** • [1] angle QCB, (ii) Answer angle RSC. (iii)

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(b)(iii)

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[2]

Answer

For Examinar's Use TA and TB are tangents to a circle centre O and AT produced meets OBproduced at Y. BC is the diameter of the circle.  $\hat{Y}B = 12 \text{ cm}$ , TB = 5 cm, OA = r cm and angle  $AOB = 67.4^{\circ}$ . B Find angle ACO (a) [1] Answer Prove that triangles BTY and AOY are similar. **(b)** [2] Answer (b) Write down the length of TA. (c) Answer

For xamiler's (ise	(d)	Calculate the length of TY.	For Examinar Use
	(e)	Answer (d) $\frac{\text{cm}}{AY}$ [1]	
	<b>(f)</b>	Answer (e)  Calculate the value of r.	
	a de la composição de la c	Answer (f) $r = $ [2]	The state of the s

There are three identical balls in each of the two bags. (a) The balls in Bag A are marked with numbers 1, 3 and 5 respectively, while the balls in Bag B are marked with numbers -1,0 and 1 respectively. One ball is selected from each bag at random and the numbers of the two balls are added up. [2] Complete the possibility diagram below. (i) Bag B 0 Bag A 3 Find the probability that (ii) (a) the sum will be lesser than 4, Answer (a)(ii)(a) (b) the sum is a prime number. (a)(ii)(b)Answer

www.testpapersfree.com

[2]



Bag X contains 6 black balls and 4 white balls. Bag Y contains 3 (b) black balls and 7 white balls. A ball from either bag is selected by tossing a fair coin. If a head appears, a ball from bag X is selected. If a tail appears, 2 balls are selected from bag Y, one after another without replacement.

Complete the following tree diagram. (i)

H - Head 2nd Ball 1st Ball Coin T - Tail B - Black ball W - White ball

Find the probability of selecting (ii) (a) two black balls,

Answer (b)(ii)(a) [1]

(b) at least one black ball.

Answer

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!\\\	ty o ylond onto broceni		- <del> </del>	West Control of the C	Fot Exertine
les ironinar's line	8	(a)	(i)	Simplify $\frac{3m-n}{4} - \frac{5m}{6}$ ,	() <u>eu</u>
in the state of th		()	(-)	4 6	
	;				
- justini				•	
				•	الادواء المالية
1	i				F.
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				Answer (a)(i) [2]	
			(ii)	(a) Factorise $x^2-9$ .	
			• •	(4)	
				Answer (a)(ii)(a) [1]	
				Million (anima)	
	1			(b) Hence, simplify $\frac{x^2-9}{2x^2-12x+18}$ .	
	l			ZX -12X+18	
	1				
					:
				Answer (a)(ii)(b) [2	1
				- North Control of the Control of th	- <u> </u> -

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For Examiner's The (b) Solve the simultaneous equations.

Fur Excuniner's Use

$$3x-2y=-18$$
$$5x+4y=-8$$

Answer (b) 
$$x = \frac{1}{1 + 1}$$

$$y = [3]$$

(c) (i) Express  $x^2-5x-9$  in the form of  $(x+p)^2+q$  where p and q are constants.

(ii) Hence, solve the equation  $x^2 - 5x - 9 = 0$ , giving your answers to 3 decimal places.

Answer (c)(ii) 
$$x = 0$$
 or [3]

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The table below gives some values of x and the corresponding values of y, correct to 2 decimal places, for  $y = \frac{x(x-2)(x-4)}{x}$ 

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<i>y</i> , 00.				r			4		أنب المساملة	أدارها المتحدد والمساوية	Į,
	X		1	L	-0.5	5 0		0.5	1	1.5	
	v			-3.75	-1.4	1 0		0.66	0.75	k	
deferration to	(marion) Alamonio		I		1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<b>****</b>				7
Γ <sub>γ</sub>		2	1	2.5	3	3.	5	4	4.5	5	

0.75

-0.66

(a) Calculate the value of k, correct to 2 decimal places.

-0.47

Answer (a) 
$$k =$$
 [1]

(b) Using a scale of 2 cm to represent 1 unit on each axis, draw a horizontal x-axis for -1 ≤ x ≤ 5 and a vertical y-axis for -4 ≤ y ≤ 4 on the grids provided. On your axes, plot the points given in the table and join them with a smooth curve.
[3]

Anglo-Chinese School (Barker Road)

Lings to Principle	(e)	By drawing a tangent, find the gradient of the curve at the point (4,0).	For lisamher's Use
2000			
7 (A. 1977) - 1977			The state of the s
Common to the property of the second			COLUMBIA WAY THE OWNER WAY THE
All their their states of the	/a\\	Answer (c) [2]  (i) Using your graph, find the solution of	Section of the sectio
The second secon	(d)	(i) Using your graph, find the solution of $\frac{x(x-2)(x-4)}{4} = 2$	
And the second s		å	
Cardo V. Carrier Const. In Security Const.		Answer (d)(i) $x = [1]$	
The control of the co		(ii) Hence, find the values of x for which $\frac{x(x-2)(x-4)}{4} \ge 2$ .	
A Company was the company of the com			A. 1924.
			THE TREE TREE TREE TREE TREE TREE TREE T
		Answer (d)(ii) [1]	2.00
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PartnerInLearning

In (a) Joshua takes 40 minutes to drive from his home to a shopping mall. The distance between his home and the shopping mall is 40 km.  (i) Find Joshua's average speed in km/h.  Answer (a)(i) km/h [2]  Mitchel, drives from his home to the same shopping mall at an average speed of 72.6 km/h.  Mitchel takes 20 minutes and arrives at 1412 h.  (ii) Find the distance, in metres, between Mitchel's home and the shopping mall.  Answer (a)(ii) [2]  (iii) Find the time at which Mitchel leaves home.	سنست		
Answer (a)(i)  Mitchel, drives from his home to the same shopping mall at an average speed of 72.6 km/h.  Mitchel takes 20 minutes and arrives at 1412 h.  (ii) Find the distance, in metres, between Mitchel's home and the shopping mall.  Answer (a)(ii) [2]	10	(a)	Joshua takes 40 minutes to drive from his home to a shopping mall.  The distance between his home and the shopping mall is 40 km.
Mitchel, drives from his home to the same shopping mall at an average speed of 72.6 km/h.  Mitchel takes 20 minutes and arrives at 1412 h.  (ii) Find the distance, in metres, between Mitchel's home and the shopping mall.  Answer (a)(ii) [2]  (iii) Find the time at which Mitchel leaves home.	:		(i) Find Joshua's average speed in km/h.
Mitchel, drives from his home to the same shopping mall at an average speed of 72.6 km/h.  Mitchel takes 20 minutes and arrives at 1412 h.  (ii) Find the distance, in metres, between Mitchel's home and the shopping mall.  Answer (a)(ii) [2]  (iii) Find the time at which Mitchel leaves home.			
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Mitchel takes 20 minutes and arrives at 1412 h.  (ii) Find the distance, in metres, between Mitchel's home and the shopping mall.  Answer (a)(ii) [2]  (iii) Find the time at which Mitchel leaves home.			Mitchel, drives from his home to the same shopping mall at an
Answer (a)(ii)  (iii) Find the time at which Mitchel leaves home.			average speed of 72.6 km/h.  Mitchel takes 20 minutes and arrives at 1412 h.
(iii) Find the time at which Mitchel leaves home.			(ii) Find the distance, in metres, between Mitchel's home and the shopping mall.
(iii) Find the time at which Mitchel leaves home.			See The Control of th
(iii) Find the time at which Mitchel leaves home.			
(iii) Find the time at which Mitchel leaves home.			
(iii) Find the time at which Mitchel leaves home.			
			Answer (a)(ii) [2]
Answer (a)(iii)			(iii) Find the time at which Mitchel leaves home.
Answer (a)(iii)			
Answer (a)(iii) [1]			 : :
Answer (a)(iii)			dumnar (aViii)
			Answer (a) in

(b) The diagram shows the speed time graph of an object over a period of 100 seconds. The object traveled 0.5 km in the last 60 seconds.

Speed (m/s)

(i) Calculate the acceleration of the object during the first 40 seconds.

Answer (b)(i)  $m/s^2$  [2]

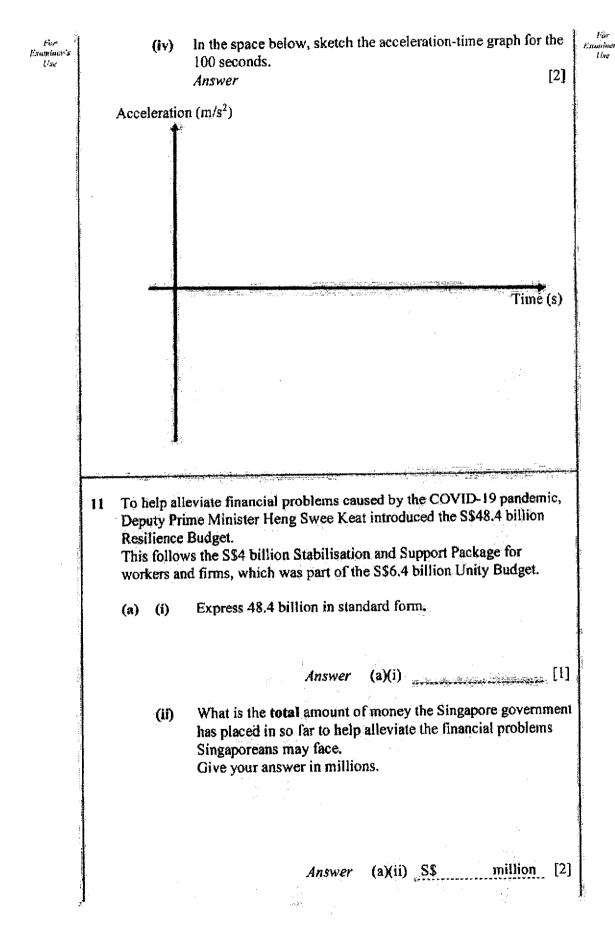
(ii) Calculate the duration, in seconds, when the object was travelling at a constant speed.

Answer (b)(ii) s [2]

(iii) Calculate the average speed, in m/s, of the car in the 100 seconds.

Answer (b)(iii)

m/s. [2]









The Singapore Government will provide direct cash assistance to more self-employed people, to help them tide over this difficult period

- Introduce a \$\$1.2 billion SEP Income Relief Scheme (SIRS) to provide eligible self-employed people with \$\$1,000 a month for 9 months
- Extend the SEP Training Support scheme to Dec 2020
- Enhance the SEP Training Support scheme's hourly training allowance from S\$7.50 to S\$10, with effect from May 1, 2020



Note: SEP means Self-Employed People

(b) (i) Using the information above, estimate the number of eligible self-employed people the Resilience Budget will be able to help?
Give your answer to the nearest whole number.

Answer (b)(i) [1]

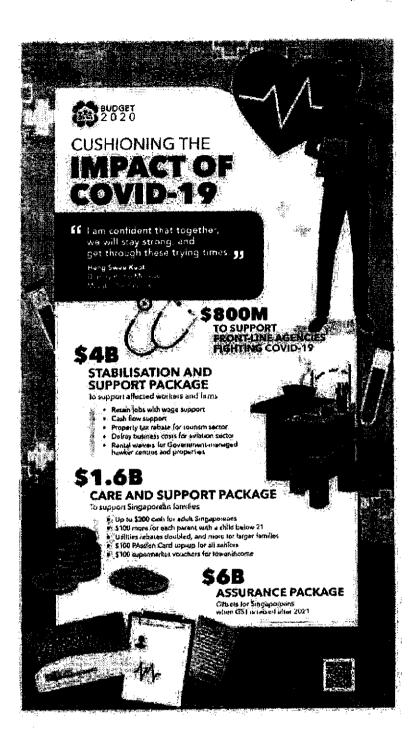
(ii) As of September 2019, there is a total of 4026200 Singaporeans and Permanent residents.

What is the percentage of Singapore Residents who will receive aid from the Resilience budget?

Answer (b)(ii) [2

Anglo-Chingse School (Burker Road)

Langua .



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Ped Io didanjalicie (k. Elice As part of the utilities rebate given to Singaporeans, all households with at least I Singapore citizen will receive a \$100 Solidarity Utilities Credit. In addition to that, they will also receive further rebates depending on their housing type which is illustrated in the table below.

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and the second s	and the second s	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	The second secon
Housing Type	Rebate received in April 2020	Rebate received in July 2020	Rebate to be received in October 2020
L- and 2- Room	\$300	\$300	\$100 or \$200
3-Room	\$270	\$270	\$90 or \$180
4-Room	\$240	\$240	\$80 or \$160
5-Room	\$210	\$210	\$70 or \$140
Executive/ Multi- Generation	\$180	\$180	\$60 or \$120

	Adam's family	Sherman's family
Number of working adults (inclusive of both parents who are working)	2	
Number of seniors	2	0
Number of children below 21	2	2
Type of household	5-room HDB flat	Executive Mansionette

The table above shows the number of people living in Adam and Sherman's household.

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Find out which set of family will receive more aid and by how much more by September 2020. Both sets of family are not considered as lower income and are not considered as large families as well.

**End of Paper** 



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Marking Scheme
Secondary 4 Express / 5 Normal Academic
Mid-Year Examination 2020

(Barker Road)

## Answer Key (Paper 1)

	5x+15=2x+9 $x=-2$			
2(a)			A THE STREET OF THE PROPERTY O	The second secon
2(b)				- Proposition Calculation and annual mendional management and an experience of the contract of
3(a)	8n-3		Marian State Company	Section 1
3(b)	8n-3=199 $n=25.25$ Since n is not an integer, 199 cannot be a term of this sequence.			OUT TO SERVICE STREET,
4	$375cm^{2}:15km^{2}$ $1cm^{2}:0.04km^{2}$ $1cm:0.2km$ $0.2km=0.2\times100000=20000cm$ $n=20000$		The second secon	many or a many many many or and a series of the series of



lo-Chinese (Barker Ros	Suito			T
<b>5</b>	$T = \frac{k}{x^2}$ $36 = \frac{k}{x^2}$			
	$T = \frac{k}{(3x)^2}$	S//PT) f PR) -18 =9 wo of the numbers		
	$T = \frac{1}{9} \left( \frac{k}{x^2} \right)$			The State of
	$T = 36 \times \frac{1}{9}$ $= 4$	· The second sec		
6	$\angle PQU = \angle QRS \text{ (corr } \angle s, QU//RT)$ $\angle QUP = \angle RSQ \text{ (corr } \angle s, QS//PT)$ RQ = QP  (Q  is midpoint of  PR) $\therefore \Delta QUP = \Delta RSQ(AAS)$			The state of the s
7	$y = \frac{1}{2}a^{x+i}$ $1 = \frac{1}{2}a^{0+i}$ $a = 2$			And the second s
	$y = \frac{1}{2} \times 2^{x+1}$ $8 = \frac{1}{2} \times 2^{q+1}$ $q = 3$			Annual Commence of
8	The smallest number is 27-18 =9 Since mode is 20, at least two of the numbers will be 20.			Account to the second s
	$\frac{9+20+20+27+x}{5}=20$	NATION AND ADMINISTRATION OF THE PARTY OF TH		
	x = 24 The five numbers are 9, 20, 20, 24, 27,			



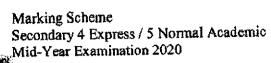
io-Chinese (Barker Ro	School		
<b>)</b>	$(2k+1)^{2}-1$ $= 4k^{2} + 4k + 1 - 1$ $= 4k^{2} + 4k$ $= 4(k^{2} + k)$		The state of the s
Marketon Production Control of Control	Since $(2k+1)^2 - 1 = 4(x^2 + x)$ , $(2k+1)^2 - 1$ is a multiple of 4 for all values of k.	· · · · · · · · · · · · · · · · · · ·	
10(a)	22		_
10(b)	$5^{3} \div 5^{-c} = 1$ $5^{3-c-c} = 1$ $5^{3+c} = 5^{0}$ $3 + x = 0$ $x = -3$	pun ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	The desiration of the second s
(a)	ab(7b−1)		
11(b)	(2p-5q)(3x-y) or $(5q-2p)(y-3x)$		
12(a)	$x \ge 1$ and $x < 2$ $1 \le x \le 2$		
12(b)			
13	$(A)^{3} = \begin{pmatrix} x \\ 3n - x \end{pmatrix}$ $A^{3} = \frac{x}{3n - x}$ $A^{3}(3n - x) = x$ $3A^{3}n - A^{3}x = x$ $x + A^{3}x = 3A^{3}n$ $x = \frac{3A^{3}n}{A^{3}}$		



Server Post	chool Wild Feat Examination			1	
4	$30000(1+\frac{x}{100})^2 = 31800$				
5	x = 2.9563				
	=2.96(3sf)			1	
5					
₩ :	$\frac{5}{1-x} + \frac{1}{x^2-1}$	1			
- 1	$= \frac{5}{1-x} + \frac{1}{(x-1)(x+1)}$	e de la companya de l			
214 1					
b. (	$=\frac{-5}{x-1}+\frac{1}{(x-1)(x+1)}$				
	· · · · · · · · · · · · · · · · · · ·		10 m		
	$=\frac{-5(x+1)+1}{(x-1)(x+1)}$				
	$=\frac{-5x-5+1}{(x-1)(x+1)}$				
	$= \frac{-5x-4}{(x-1)(x+1)}$				
16(a)	$s = r\theta$				
	$3.5 = r \times 0.5$				
	r=7				
16(b)	Angle of major sector = $2\pi - 0.5$			i.	
	$\frac{1}{2}r^2\theta$				
	Area of major sector = $=\frac{1}{2} \times 49 \times (2\pi - 0.5)$			-	
	<u> </u>				
	$=49\pi-12.25$	1			****
17(a)	$4410 = 2 \times 3^2 \times 5 \times 7^2$				
17(b)	10				
17(c)	210				
18(a)	$(n-2)\times180 =$				
·	n = 10	4			
18(b)	If the interior angle is 130°, the exterior angle will be 50°.				

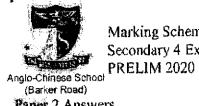


Barker Ro	$\frac{360}{n} = 50$			-
	n = 7.2 The number of sides should be a natural number	A PROPERTY OF THE PROPERTY OF		The second se
ing and the second	or the number of sides should be a positive integer.			
	Volume of a can			
	$=\pi(6)^2(10)$			
	=1130.9733	:		
	Maximum possible number of cans			
	12960			
	1130.9733 =11.4591			
	=11(max)			
9(b)	Remaining water in the tank	1		
(2(0)	= 12960 - 1130.9733×11			
	= 519,2937			20.00
	= 519 cm <sup>3</sup>	·		
				de participa de la constanta d
·· dober ·				
the point in med Commenter	$\sqrt{85^2-84^2}=13$		The state of the s	
and a	Since $AD^2 + DC^2 = 5^2 + 12^2 = 13^2 = AC^2$ , by the converse of Pythagoras' Theorem, triangle ABC is a right-angled triangle.			7
21(b)				
21(c)				
			And the second s	the state of the s
	The second secon		-	



Berker Rose	Mid-Year Examination 2020		Secretary of the Control of the Cont
2(a)	This pie chart is not useful as it does not show clearly the difference between the number of votes for each flavour.  Or this pie chart is not useful as it is hard to		
	determine which is the most popular or least popular flavour.		
22(b)(i)	Someone might prefer Battery A as the median lifetime of the battery is longer than the median lifetime of Battery B.		
	Or some might prefer Battery A as the maximum lifetime of the battery is longer than Battery B.		
22(b)(ii)	Someone might prefer Battery B as the minimum lifetime is longer than Battery A. Secondly, the interquartile range is smaller than Battery A which means Battery B's lifetime is more consistent and reliable.		The fill and experience of the second
23(a)			The second secon
23(b)	x=-1	=200 T 100 PM (100 PM )	1
23(c)	q<4		

jio-Chinese : (Barket Rol	Gioci	lys		<u> </u>
	$\sqrt{\left(-6-(-14)\right)^2+(2-4)^2}$		:	
	$=\sqrt{68}$			
	= 8,25 units(3sf)			
24(b)			40. 44. 44. 44. 45. 45. 45. 45. 45. 45. 45	77.00
24(0)	The state of the s	Ÿ		
			:	
	4			
í	Intercept = -2.5			* or ::
:	Equation: $y = -\frac{1}{4}x - \frac{5}{2}$		÷	
	4 2		A STATE OF THE STA	7
25(a)	4.8 cm or $4\frac{4}{5}$ cm			
25(b)	125:27:8	1		
	A:125u = \$25	: : : : : : : : : : : : : : : : : : : :		
	1u = \$0.184			
	B:27u=\$10			- T
	1u = \$0.37037			
the state of the s	C:8u = \$8.50			
	1u = \$1.0625			
entransministrative de la company de la comp	Bottle A is more value for money.			
	108000 + 1.2			
	= 90000			1
26(b)	108000-46570=61250			-
in the second se	First 40000, pays \$550.			-
114 11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Next 21250 pays 7% which is \$1487.50			
	Total tax payable = $550 + 1487.50 = $2037.50$			



	kerRoa - 2 Au	iswers				M 27 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
19134	(a)	13 17 013	\$20				
	(b)	and the second	\$11.25 to \$11.50				
	(c)		\$12 to \$12.15			:	
	(d)		350 – 40			A PARTY NAME OF THE PARTY NAME	
grys consumeration are the relief before	Hann Brand William V	<del>-1 </del>	310		<u>.</u>		
2	(a)	(i)					
		(ii)	$\frac{400}{x} + 1.30$				inferior action in the contract of the contrac
- The second sec	(b)		$\left(\frac{400}{x} + 1.3\right)(x - 50) = 2925$			:	
Andreas and the state of the st			$400x - 20000 + 1.3x^2 - 65x = 2925x$	The second secon			
		,	$1.3x^{2} - 2590x - 20000 = 0$ $13x^{2} - 25900x - 200000 = 0 $ (Shown)			:	
	(c)	:	$(13x+100)(x-2000) = 0$ $x = 2000 \text{ or } -\frac{100}{13}$			:	
The second secon	(d)		As the number of masks has to be a whole number / positive integer so $x = -\frac{100}{13}$ has to be rejected.			:	
		All and A Principles			7		
And the second of the second o							The state of the s
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Anglo-Chinese School (Barker Ross)			Se principal action in the second		
3 (a)	$ \begin{pmatrix} 13 & 37 & 41 \\ 11 & 45 & 48 \end{pmatrix} $		:	THE STATE OF THE S	A CONTRACTOR OF THE PROPERTY O
(b)	\( \begin{pmatrix} 11.5 & 40 & 38 \\ 11.5 & 38.5 & 34.5 \end{pmatrix} \)			en e	A COLUMN TO THE PARTY OF THE PA
(c)	The average number of bags of 3 kg, 5 kg and 10 kg supplied to each minimart in January and February respectively.			A Control of the Cont	
( <b>d</b> )	$\begin{pmatrix} 10 & 43 & 35 \\ 12 & 32 & 21 \end{pmatrix} \begin{pmatrix} 3 \\ 5 \\ 10 \end{pmatrix}$				
And the second s	=\begin{pmatrix} 595 \ 406 \end{pmatrix}				
(e)		Marian San San San San San San San San San S			en ( o ) . ( va )
				The state of the s	ality, chinal appropriate and an arrangement of the control of the
A STATE OF THE STA					
and the second s					
					The second secon
			22.00		and a second



nglo-Chinese Scho (Backer Road)					
4 (a)	$\angle PSQ = 25^{\circ}$				:
	no 70		:		
	PQ 70 sin 25° sin 40°			en in Control of the	-
	SIN 23° SIN 40				
	PQ = 46.02341096				i
	= 46.0 m (3sf)			1	
				-	.!
(b)	$RS^2 = 100^2 + 70^2 - 2(100)(70)\cos 65^\circ$				:
	$RS = \sqrt{100^2 + 70^2 - 2(100)(70)\cos 65^\circ}$				
	RS = 94.7805061				
	= 94.8  m  (3s1)	L.		1	
	<b>3</b> :			į.	
(c)	Area = $\frac{1}{2}$ (100)(70)sin 65°	[*: 	<b>\</b>	4:	
	4				
	$= 3172.077255 = 3170 \text{ m}^2 \text{ (3sf)}$	:			
				:	
(d)	$\int \frac{1}{2} (94.7805061) d = 3172.077255$	1			
	2`				
	d = 66.93522509		ŀ		
			100 m	- Principal Control of the Control o	
	$\tan\theta = \frac{50}{d}$			i i i i i i i i i i i i i i i i i i i	
	d d				
	(50)		ľ		
	$\theta = \tan^{-1}\left(\frac{50}{d}\right)$			1	
	\"''				
	$=36.8^{\circ} (1dp)$		1	,	
(e)	Beariug = $(150^{\circ} - 40^{\circ}) + 65^{\circ}$	į			
(-)		1			
	=175°	\$		and the second s	
and the state of t	The second secon		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
		-			
			And the second s		
	eth-sping and sping and sp				
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Ar	iglo-C	hinese S ker Roa	chool	RELIM 2020	4		E f
	5	(a)	G)	Surface area = $2 \times \frac{1}{2} (8+6)(4) + (8+5+5+6)(15)$			
-				= 416 cm <sup>2</sup>			1
***************************************		(b)	(i)	31			A Commission of the Commission
			(ii)	104			
			(iii)	104 – 31			
		. History		73			
	6	(a)		33.7°		:	4
		(b)		∠Y is a common angle			
١				$\angle BTY = \angle AOY = 90^{\circ}$ (tangent perpendicular to radius)			
-				By AA test, triangles BTY and AOY are similar			
W. Carrier Management		(c)		5	200		
		(d)		13			22(18)
		(e)		<u>5</u> 12			
- Person				12			
		(f)		$\frac{r}{12+r} = \frac{5}{13} \text{ alternatively } \frac{r}{18} = \frac{5}{12}$			
				r = 7.5			
	-						
					4		
. i				A CONTRACTOR CONTRACTO	4		
;				-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t			
					The state of the s		
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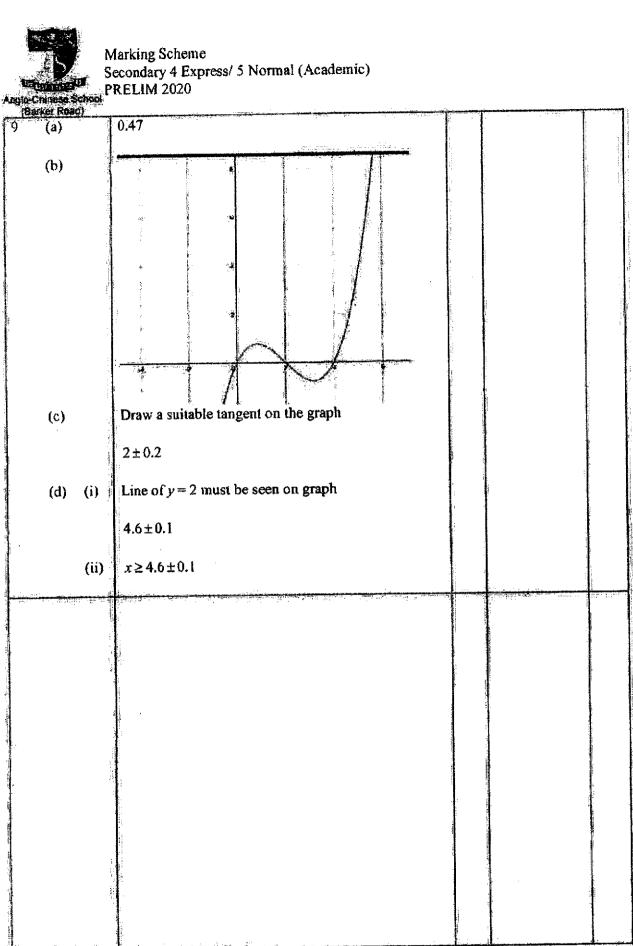


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7 (a)	(i)	+     -1     0     1       1     0     1     2       3     2     3     4       5     4     5     6		700 A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 (10)
A de la companya de l	(ii)	(a) $\frac{5}{9}$	The second secon		
	1	(b) $\frac{4}{9}$			
	1	$\frac{3}{10}, \frac{6}{9}$			
		(a) $\frac{1}{30}$	And the second s		
		(b) $1 - \frac{1}{2} \times \frac{4}{10} - \frac{1}{2} \times \frac{7}{10} \times \frac{6}{9}$ or $\frac{1}{2} \times \frac{6}{10} + \frac{1}{2} \times \frac{3}{10} + \frac{1}{2} \times \frac{7}{10} \times \frac{3}{9}$		2	
	e gitye hawar arabira	17 30		way, and the same of the same	
Market Ma	. 1992 - W. BRICK ALLEGO		described and the second secon		
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Applo-	Jainese eker Boi	SCHOOL	REELIVI 2020	······································		·
8		(i)	$\frac{3(3m-n)}{12} - \frac{2(5m)}{12}$ or $\frac{6(3m-n)}{24} - \frac{4(5m)}{24}$	İ		
		in an in a second	12 12 24 24		handhaman a Abi ya if fa	The residence of
			$= \frac{-m-3n}{12}$			T. C.
			12			
		(ii)	(a) $(x+3)(x-3)$			
			(			
			(b) $\frac{(x+3)(x-3)}{2(x-3)^2}$			
		1				
			$=\frac{x+3}{2(x-3)}$			
ŝ						
	(b)	•	Sub $y = \frac{3x+18}{2}$ into $5x+4y=-8$		'	
)			_			
			x = -4 and $y = 3$			
	(c)	(i)	( 5) <sup>2</sup> 61			
			$(x-2.5)^2-15.25$ or $\left(x-\frac{5}{2}\right)^2-\frac{61}{4}$			4 4
		(ii)	$(x-2.5)^2-15.25=0$		į	
		(***)	(x-2.5) -15.25 = 0 $x = 2.5 \pm \sqrt{15.25}$			
Place 1			λ = 2.5 £ γ15.25			
			x=6.405,-1.405		School and Tables are not the second the	
		;				
		:		i.		
					:	
		-			,	
				of the		
				-	A CONTRACTOR OF THE CONTRACTOR	
:						







Anglo-Chine	se School	RELIM 2020			
(Barker)	<u>3oed)</u> ) (i)	RELIM 2020 $40 \div \frac{40}{60}$		*	di esta
المقالة التابعة		= 60 km/h		:	
	(ii)	$72.6 \times \frac{20}{60} \times 1000$			
		= 24200 m	STATE COMMET TO SEE		
		1352 h			100
		$\frac{10-6}{40}$			
		$= 0.1 \text{ m/s}^2$		The state of the s	
North Fifty to Block with the second	(ii)	$\frac{1}{2} \times 10 \times (x+60) = 500$			
		x = 40  s			
4 pro-	(iii)	Average speed = 820÷100			
		= 8,2 m/s		And the second s	
: 4	(iv)	acceleration (m/s²)			
		(ime(s)			
		40	The state of the s		AND THE RESIDENCE OF THE PROPERTY OF THE PROPE
			-		
				The state of the s	
				7	



## Secondary 4 Express/ 5 Normal (Academic) PRELIM 2020 (Barker Road)

1	DESTRUCT INC	<i></i>						
11	(a)	(i)	4.84×10 <sup>10</sup>				A Comment	
eine Communication (Communication)		(ii)	$48.4 \times 10^9 + 6.4 \times 10^9$				100	
Mark off descent as manufactured the water			$= 5.48 \times 10^{10} = 54800$ million					
	(b)	(i)	133333	- man comment				
		(ii)	133333 4026200×100%	And the second s			And the second s	The second second
			= 3.31%				Address: September 1997	- Anna Maria
	(c)	4	Amount received by Adam's family = 2 (400) + 2(100) + 100 + 2 (210) + 2 (300)					
			= \$2120					
			Amount received by Sherman's family $= 2 (400) + (300) + 100 + 2 (180)$					
***			=\$1560		and the second s		W. C.	
			Adam's family received more aid by \$560		: :	يترافي وال		1