2019-2020 S4 1st TERM EXAM-MATH-CP 1

19-20 F.4 1st TERM EXAM MATH CP PAPER 1

> 2019 – 2020 Form 4 1st Term Examination

MATHEMATICS Compulsory Part

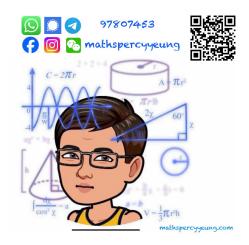
PAPER 1

Question-Answer Book

6th January, 2020. 8:15 a.m. – 9:15 a.m. (1 hour) **This paper must be answered in English.**

INSTRUCTIONS

- 1. Write your name, class and class number in the spaces provided on this cover.
- This paper consists of THREE sections, A(1), A(2) and B.
- 3. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
- 4. Unless otherwise specified, all working must be clearly shown.
- Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
- 6. The diagrams in this paper are not necessarily drawn to scale.



Section	Marks
A (1 – 3)	
A (4 – 8)	
A Total	/ 35
B Total	/ 15
TOTAL	/ 50

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Section A(1) (19 marks) Simplify $\frac{(a^2b)^{-3}}{a^{-4}b}$ and express your answer with positive indices. 1. (3 marks) Answers written in the margins will not be marked. Make *p* the subject of the formula $2m = \frac{4n+5p}{3p}$. 2. (3 marks)

Factorize	
(a) $2a^2 - 9ab + 9b^2$, (b) $2a^2 - 9ab + 9b^2 - 4a + 6b$.	
(b) $2u - 9ub + 9b - 4u + 6b$.	(3 marks)
	(5 1111115)
Solve the quadratic equation $(y+2)(y+3) = 5$ and express your answers in s necessary.	
	surd form i (3 marks)

Answers written in the margins will not be marked.

	f a such that $h(a) = 10$.	(4 mar
4 2		
Simplify $\frac{4}{2x-7} - \frac{3}{3x-2}$		(3 mar

Answers written in the margins will not be marked.

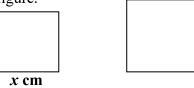
Answers written in the margins will not be marked. 19-20 F.4 1st TERM EXAM-MATH-CP 1- 4

Sect	 ion A(2) (16 marks) In the figure, the coordinate respectively. (a) Find the equation of the (b) If B (0, b) is a point on Find the value of b. (b) Find the area of ΔABC. (c) Find the area of ΔABC. (d) A straight line passing BC at D such that the units. Find BD: DC. 	e straight line AC. the y-axis such that through A cuts the l	(2 marks) $AB \perp AC$. (3 marks) (2 marks) ine segment	<i>y</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i> <i>A</i>	re 1

(a)). When $f(x)$ is divided by $x-2$, the remainder is $28-5b$. Find <i>a</i> and <i>b</i> . Tracy claims that the equation $f(x) = 4x-2$ has 3 distinct real roots. Do Explain your answer.	(3 mark you agr
		(4 mark

Section B (15 marks)

- (a) Let $f(x) = x^2 42x + 882$. Using the method of completing the square, find the 9. coordinates of the vertex of the graph of y = f(x). (2 marks)
 - (b) The length of a piece of rope is 168 cm. Sam cuts the rope into two parts. Each part is used to enclose a region in the shape of square and the total area of these two regions is $W \,\mathrm{cm}^2$ as shown in the figure.



- Express W in terms of x. **(i)**
- (ii) Tracy claims that the total area of these two regions is less than 885 cm². Do you agree? Explain your answer.

(4 marks)

Answers written in the margins will not be marked.

10.	(a)	If the quadratic equation $4x^2 - 3(2x+1) = k - x$ has two distinct real roots, find the
		range of values of k. (3 marks)
	(b)	Suppose k takes the least positive integral value. If α and β are roots of the equation
		$4x^2 - 3(2x+1) = k - x .$
		(i) Find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.
		(ii) Find the quadratic equation in r with roots $\frac{\alpha}{\beta}$ and $\frac{\beta}{\beta}$
		(ii) Find the quadratic equation in x with roots $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$.
		(6 marks)
		END OF PAPER

Answers written in the margins will not be marked.

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